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Appendix 1-1 Summary of Ad Hoc Committee, Crab Rationalization Committee, Advisory Panel, and Council Efforts on Crab Rationalization

This Appendix provides a brief summary of the proceedings of the ad hoc committee and the crab rationalization committee that developed some of the alternatives for rationalizing the crab fisheries.

A-1.1 Summary of Ad-Hoc Cooperative Committee Efforts

October 1999. At its October 1999 meeting, the Council received public testimony and a summary of recent industry meetings aimed at providing relief for the crab fleet. The Council encouraged the industry to continue to work towards a solution with broad industry support. While the industry group was not considered a formal Council committee, two Council members volunteered to facilitate future meetings.

November - December 1999. The industry group met in November and December 1999. During the December meeting, a draft problem statement was reviewed and approved as a working document to be sent to persons holding crab LLP licenses. The group considered several methods to rationalize the fishery, including a buy-back program, cooperatives, IFQs and the status quo, but did not select a preferred method.

<u>March 2000</u>. During its March 2000 meeting, the industry group decided to create two smaller committees to begin developing the details of the buyback and cooperative programs. The Ad-hoc Buyback Committee would try to move quickly to develop a vessel buyback proposal that could be submitted to Washington D.C. The Ad-hoc Cooperative Committee would move forward at a slower pace. (As discussed earlier, the efforts of the Buyback Committee contributed to the buyback program passed by Congress in December 2000.)

<u>April 2000</u>. At its April 2000 meeting, the Ad-hoc Cooperative Committee identified five major issues that required resolution: (1) catch history, (2) processor linkages, (3) community considerations, (4) skipper and crew concerns, and (4) IFQs as an alternative to cooperatives.

- (1) The Ad-hoc Committee recognized catch history as an important and controversial issue. The Committee, however, decided to postpone detailed discussions of catch history options until its May meeting but stated it would not select an option that included catch history earned after December 31, 1999. The Committee also adopted a motion that only LLP qualified vessels, including the Council's October 1998 recency requirements, would be eligible for the cooperative program.
- (2) A wide variety of perspectives were offered on the issue of processor linkages. Processor representatives felt that any cooperative (or IFQ) program must recognize and protect the investments of processors, either through co-op linkages or through mirror processor quotas (under an IFQ option). Some processors felt that the AFA-style cooperatives would provide only the minimum protection needed and that a two-pie IFQ program may be preferable. The primary concerns of harvesters centered around the issues of a 'closed class' for processors, requirements to deliver to specific processors and the potential loss of bargaining power that would result, particularly considering the involvement of processor-owned harvesters. They felt that reduced ex-vessel prices could have impacts to communities as well as harvesters.
- (3) Regarding community issues, the Committee heard from a representative of Dutch Harbor who noted that 60% of the raw fish tax (1999) related to Dutch Harbor was from crab, while a St. Paul representative noted that community was about 85% dependent on crab. Both stressed the importance of crab to these communities

and the need to design a program that maintains each community's 'share' and promotes community stability relative to the crab fisheries.

- (4) A Skippers for Equitable Access (SEA) representative presented their perspective that skippers are responsible to a large degree for the catch history of vessels and, therefore, any program based on that catch history should include skippers. They also stressed that the bargaining position for skippers would be negatively affected if they are not included, because they then become simply 'drivers' of a vessel that has a guaranteed share.
- (5) The Ad-hoc Committee discussed the issue of whether cooperatives would be the best way to proceed, as opposed to an IFQ program. It was recognized that, under an IFQ program, either sector could buy into the other; i.e., processors could obtain harvester quota shares and vice-versa. Some members of the Committee felt that, in some ways, an IFQ program may offer a more elegant solution that takes into account the concerns of both harvesters and processors.

<u>May 2000</u>. At their May 2000 meeting, the Ad-hoc Cooperative Committee worked off the original, extensive set of options previously developed by the Committee and decided to set alternatives on a fishery-by-fishery basis, starting with Bristol Bay red king crab and opilio. It was noted that the options selected are for determination of allocation percentages, assuming that the Council's collective LLP actions will determine the field of eligible participants. The Ad-hoc Committee also heard proposals from the (1) processing sector, (2) the community of St. Paul, and (3) Skippers for Equitable Access (SEA).

- (1) The processor proposal essentially would create both harvesting and processing shares (as either quota shares or in a co-op format), which would have to be matched up in a given fishing year. Options for calculating processors' relative shares all were based on more recent participation (1995-1999) in each fishery.
- (2) The community of St. Paul offered a proposal designed to maintain community participation in the crab fisheries. Rather than a direct allocation of shares, this proposal recommends a minimum amount (percentage) to be delivered to specific geographic regions (Pribilofs, Aleutians and Kodiak) based on historical delivery rates (both floating and shore-based in each area) for the agreed-upon qualifying years. This proposal suggests qualifying years that go back no further than five years. Some Committee members noted that this type of proposal may impose economic inefficiencies, given that the co-op program is designed to eliminate the race for fish and some of the processing centers have developed recently because of the race for fish. It also was noted that there may be legal impediments to this approach.
- (3) A proposal from SEA was offered which would essentially provide for 10% of the harvest shares to be set aside for allocation to active captains based on their contribution to each vessels' catch history. The Committee accepted this proposal as a starting point for future discussions but noted that the details of the proposal needed further development.

<u>June 2000</u>. In June 2000, it was decided that the Ad-hoc Cooperative Committee needed to continue its work before turning the alternatives over to the Council process for formal analysis. The Committee, however, requested the Council to designate staff support to develop a database that could be used to evaluate landings data, processing data, individual percentages, etc., for harvesters and processors with respect to a given set of years and alternatives. (An Excel spreadsheet program was developed as a result of this request and made available on the Council's web site.)

The Ad-hoc Committee requested that the Council address BSAI crab rationalization as a formal 'topic of the Council's attention on the Council Agenda.' They also requested, to the extent possible, that the Council recognize the Ad-hoc Cooperative Committee as the advisory entity to the Council with respect to the development of options for BSAI crab rationalization. Finally, the Ad-hoc Committee received a report from SEA which outlined a new proposal for skipper inclusion (as a compromise to their original proposal for a 10% allocation of any vessels' quota shares). The new proposal is for a guaranteed minimum crew share at traditional rates and a first right of refusal for 10% of any quota shares (QS) sold.

A-1.2 Summary of Crab Rationalization Committee Efforts

October 2000. At its October 2000 meeting, the Council received a report from the Ad-hoc Committees regarding the industry initiatives to facilitate a buyback program for the BSAI crab fisheries and development of cooperative or IFQ alternatives for rationalizing those fisheries. The Council voted to formalize the process by establishing a Crab Rationalization Committee whose first task would be to review the following Draft Problem Statement and formulate specific alternatives and options for Council consideration:

The crab fisheries in the BSAI are fully utilized. Despite amendments to the License Limitation Program and AFA sideboards, capacity in these crab fisheries far exceeds available resources. The ability for crab harvesters to diversify into other fisheries has been severely curtailed under the LLP program and other management actions designed to bring stability to other gear groups and species. Many of the concerns identified by the North Pacific Fishery Management Council in 1992 still exist for the BSAI crab fisheries, including:

- 1. Resource problems
- 2. Excess harvesting capacity
- 3. Bycatch mortality and deadloss concerns
- 4. Safety
- 5. Economic stability

As a necessary step in the continued process of comprehensive rationalization, prompt action is required to protect the crab resource and to promote stability for those dependent on the crab fisheries, which includes harvesters, processors, and coastal communities.

<u>December 2001</u>. At its December 2001 meeting, the Council reaffirmed its intent to appoint a formal Council committee to address crab rationalization. The Council appointed members to the BSAI Crab Rationalization Committee shortly thereafter, which included representatives for harvesters, processors, skippers and crewmen, communities and environmental organizations. The Committee was tasked with developing elements and options for analysis and reporting to the Council at the April 2001 meeting.

January 2001. In January 2001, the BSAI Crab Rationalization Committee reviewed the Council's Draft Problem Statement and the direction from the Council to develop alternatives, elements, and options for crab rationalization which would be forwarded to the Council for formal analysis. The formal Committee discussed and recognized the importance of the work previously done by the Ad-hoc Cooperative Committee as a starting point for further development. While the Committee's charge was not to develop a preferred alternative for the Council, there was a consensus that they should strive for as much definition as possible in program design, to facilitate both the staff's analysis and the Council's deliberations. Because of the economic state of the crab

fisheries, it was also noted that the industry's potential response to the \$50 million loan for the buyback could be affected by the timeliness and commitment to rationalization and the ultimate design of the program.

<u>February 2001</u>. The BSAI Crab Rationalization Committee met in Seattle on February 15-16, 2001. While the focus of the Ad-hoc Committee had been on coop-style approaches to rationalization, the formal Committee focused mainly on IFQ-type programs. The Committee reviewed proposals from representatives for each sector, including harvesters, processors and communities (representatives for skippers/crew and the environmental organizations were absent). These three proposals became the basis for the three components of the IFQ program alternative considered in this analysis.

The harvesting sector proposal included a problem statement, a set of objectives, a suite of options for IFQs for catcher vessels and a set of conditions that would make a two-pie system more acceptable for harvesters. The IFQ options would apply either to a harvester-only (i.e., one-pie) IFQ system or to a two-pie IFQ system that would allocate separate quota shares to harvesters and processors. The main issues discussed included the following:

- 1. General consensus was reached to include years 1990-1999 only. While a few expressed an interest in including 2000/2001, the vast majority recommended that 2000/2001 be excluded. The main reasons cited for excluding 2000/2001 were (a) processing side-boards were in effect, (b) the low GHLs in both 2000 and 2001, (c) icy conditions in 2000 delayed the season, and (d) the harvester strike in 2001.
- 2. The Committee agreed that deadloss would not count in the initial allocation but would count against a harvester's quota. The main reason cited for excluding deadloss in the initial allocation was to avoid rewarding those with high deadloss. Also, there was concern that the method used to report deadloss in the early years was not accurate.
- 3. The Committee had a lot of discussion on who would be eligible to receive quota shares by transfer. As proposed, only initial recipients or eligible crew members could receive quota shares by transfer. Concerns were raised that this may create a "closed class" system. Others suggested that participants in other (Federal) fisheries should be able to buy into the crab fishery. The Committee was not able to reach consensus on this issue and agreed to postpone further discussion until the March meeting.
- 4. The Committee discussed the various options for transferability. Since many felt that the options for transferability would require significant more thought and discussion, the Committee decided to postpone further discussion of transferability until the March meeting.

The Committee next considered a proposal for processing quota shares from representatives of the processing sector. The proposal suggested a two-pie system, in which processor shares for a predetermined percentage of the GHL would be allocated to eligible processors based on processing history, with the remainder of the GHL available to any processor as a means to promote competition. The Committee accepted the range of allocated shares suggested by the processors of 80 to 90% of the GHL, recognizing that the Council was free to broaden the range for analytical purposes. (There was much discussion and lack of consensus on this range of percentages.)

The Committee then discussed how the processing quota share system would be implemented. In order to implement the processing quota share system, harvesters would receive two classes of harvesting quota shares,

A and B. Any amount harvested using Class A shares must be delivered to a processor holding processing quota shares. Any harvest using Class B shares may be delivered to any processor qualified to receive harvest under the "open access" terms and conditions.

With respect to the two-pie IFQ proposal, the Committee discussed several other issues identified by those representing the harvesting sector. The Committee agreed that the degree of vertical integration (processor ownership of harvesters) should be analyzed. The degree of vertical integration is viewed as relevant to whether restrictions are needed to prevent further vertical integration of the industry. Staff noted that determination of the degree of vertical integration may be expensive and time consuming. Members representing the processing sector agreed that processors would provide this information.

The Committee next reviewed a proposal to restrict transfers of harvesting and/or processing shares between regions of the BSAI. Two regions were proposed: a Pribilof /Bering Sea Region (PBS) and an Aleutian Chain/Alaska Peninsula Region (ACAP). Under the proposal, an endorsement would be assigned to processing shares which restricts the region in which the shares may be used based on deliveries to the region in the past. The endorsements would be assigned to harvesting shares, if processing shares are not approved. Under the regionalization model, harvesting and/or processing quota shares may be transferred within a region but transfers between regions would be restricted. The Committee agreed that the proposed regionalization model should be considered as an overlay to the harvester and/or processor quota share programs for purposes of analysis.

March 2001. The Crab Rationalization Committee met in Anchorage on March 22-23. The Committee further refined the proposals and options developed at its last meeting and considered a letter from ADF&G dated March 22, 2001 that outlined some of the State's views on rationalization. The Committee also received proposals from representatives of Skippers for Equitable Access (SEA) and the Alaska Marine Conservation Council (AMCC).

Representatives from ADF&G provided an overview of the State's letter. In general, the ADF&G letter expressed support for rationalization but also outlined several concerns, including the following: (1) if guideline harvest levels (GHLs) are replaced by total allowable catches (TACs), ADF&G may need to be more conservative for some crab stocks, (2) seasonality will continue to be an issue since certain characteristics of the fishery (e.g., soft shell stage) will continue to warrant controls, (3) funding sources for management, research and enforcement, (4) rationalization efforts need to keep community interests in mind, and (5) more aggressive data collection is needed to monitor economic impacts. The Committee discussed these issues and agreed to recommend that the Council request the State to work with staff to address two issues: (1) collection of economic data to monitor the impact of rationalization, and (2) funding sources for management, research and enforcement.

The Committee next considered a proposal from AMCC. In general, AMCC indicated that it is not opposed to rationalization but supported measures that would promote conservation and safety, and provide incentives for clean fishing. Some specific options that AMCC expressed support for included (1) an option that does not include processing shares, (2) measures that would preserve choices for harvesters and opportunities for processors, and (3) an option for a periodic program review of the program.

The SEA representative presented a proposal for skippers and crew members. The proposal reflected SEA's desire to protect traditional crew share percentages and provide eligible crew members with a "first right of

refusal" on 10% of all shares transferred. In addition, the proposal included an option for a low interest-rate loan program to assist crew purchases of QS.

The Committee devoted the remainder of its time to finalizing the options for analysis, focusing in particular on the transferability issues and how the different components of the program would fit together. Some of the issues that involved extensive discussion by the Committee include (1) who is eligible to receive QS by transfer, (2) whether there should be an allocation of QS to communities or CDQ groups, (3) ownership caps on harvester QS, (4) qualifying years for processor shares, (5) percentage of GHL for which processor shares would be issued, (6) regionalization, (7) whether AFA vessels should be allowed to form a cooperative for Bristol Bay red king crab, (8) caps on processor ownership of harvester QS, (9) whether 1990 and 1991 should be dropped from the options for harvester QS qualifying periods, and (10) whether the analysis could address the effects of catch history of vessels that are no longer in the fishery on the initial allocation of harvester QS.

A-1.3 Summary of Council and Advisory Panel Efforts

<u>April 2001</u>. At the April 2001 Council meeting, the Crab Rationalization Committee's recommended elements and options for a crab rationalization program were presented to both the Council's Advisory Panel (AP) and to the Council. Both the AP and Council received public testimony on this agenda item.

Based on public testimony and discussion among its members, the AP added a number of options to the Committee's proposal for the Council's consideration. For example, the AP significantly expanded the options for qualifying years for the processing quota share allocation and added an alternative approach to processing shares that would issue processing shares on a percentage of the season's GHL that ranged from 105% to 130% of the GHL. The AP also amended the options for ownership caps, added options for roll-over provisions, and requested that the analysis provide a brief discussion on the use of private-sector (non-governmental) binding arbitration for failed price negotiations. Finally, the AP recommended the analysis address 18 specific issues, most of which focused on the degree of vertical integration between harvesters and processors and the implications of the different IFQ models (i.e., one-pie, two-pie, with or without regionalization) on the competitive structure of the crab industry.

Given the complexity of the proposed elements and options and issues raised during public testimony, the Council moved to direct staff to develop a discussion paper for the June meeting on the proposed elements and options for the BSAI Crab Rationalization program. Specifically, the Council requested staff to provide perspectives on the anticipated amount of effort and time required to analyze the suite of options under consideration and, where possible, identify ways to make the analytical task more manageable. The Council requested staff to highlight in the discussion paper any proposed options that may be problematic in terms of data requirements, analytical difficulty, and management aspects in light of the Council's desire for the analysis to be completed by December 2001. The staff was instructed to use the AP motion (which includes alternatives from the Crab Rationalization Committee) as the focus of the discussion paper.

While the Council directed staff to use the AP motion as a starting point, the Council also requested that the discussion paper address several additional options as follows: (1) an expanded the range for processing shares of 0-100%; (2) an initial allocation of 0, 10%, or 20% of harvesting quota shares distributed equally to qualifying crew members; (3) expanded range of 0-20% for crew shares that would receive first-right-of-refusal; and (4) controls on vertical integration.

The Council also adopted the following problem statement for rationalization of the BSAI crab fisheries:

BSAI Crab Rationalization Problem Statement

The crab fisheries in the Bering Sea/Aleutian Islands are fully utilized. Despite amendments to the LLP Program and AFA sideboards, capacity in these crab fisheries far exceeds available resources. The ability of crab harvesters to diversify into other fisheries has been severely curtailed under the LLP program and other management actions designed to bring stability to other gear groups and species. Many of the concerns identified by the NPFMC at the beginning of the comprehensive rationalization process in 1992 still exist for the BSAI crab fisheries. The race for fish continues to result in:

- 1. Resource/conservation management problems
- 2. Bycatch/handling mortality and dead loss
- 3. Excess harvesting capacity
- 4. Lack of economic stability
- 5. Safety issues

In the continued process of comprehensive rationalization, prompt action is needed to protect the crab resource and to promote stability for those dependent on the crab fisheries. In order to achieve a balanced resolution, the concerns of harvesters, processors and coastal communities must be addressed

<u>June 2001</u>. At the June 2001 meeting, staff presented its discussion paper on the proposed elements and options for rationalization of the BSAI crab fisheries to the AP and Council (a copy of the discussion paper is provided in Appendix I). While the discussion paper was not an analysis of the proposed options, it was intended to assist the Council in finalizing a suite of alternatives, elements and options for formal analysis.

The discussion paper first addressed several legal considerations including the scope of analysis required to fulfill the mandate from Congress that the Council analyze various options for rationalization. The paper then described the various components of the proposed IFQ program alternative and discussed data requirements, particularly ownership information that would be needed from industry. (Note that industry representatives had agreed to provide the required ownership information during the Crab Rationalization Committee meetings.) The paper then discussed a variety of analytical issues for each component of the proposed IFQ program, including options for the harvesting and processing sectors, options governing the interaction between harvesters and processors, and options for regionalization. Finally, the paper provided estimates of the analytical time requirements and suggestions for streamlining the analysis. Overall, it was noted that it may not be possible to reduce the required analytical effort because of the inherent complexity of the proposed rationalization program, the number of crab fisheries under consideration and the complexity of the issues involved.

The AP recommended to the Council a number of refinements to the proposed crab rationalization options, including the following:

• identification of the crab fisheries included in the program;

- clarification of the eligibility requirements for receiving an initial allocation of QS, the basis for the QS distribution and method for calculating the distribution;
- refinement of the options for qualifying periods for harvesting QS;
- definition of sea time for the options to receive harvesting QS by transfer;
- replacement of the options governing the use of individual fishing quotas (IFQs) by catcher vessels and catcher/processors;
- elimination of options for treatment of discards under IFQs;
- elimination of one of the skipper/crew options for protection of traditional crew share percentages with no sunset;
- restatement of roll-over provisions as overage provisions;
- reduction in the number of options for qualifying periods for processing quota shares; and
- elimination of options for issuing processing shares on 105%-130% of the GHL.

Furthermore, the AP provided more detailed guidance on the option for a private-sector (non-governmental) binding arbitration process for settlement of pricing disputes since this was viewed by many to be a key design feature in a two-pie IFQ model. The AP also recommended that the Council include a comparative analysis of the proposed IFQ program models to two types of coop-style models, AFA-type and "Dooley-Hall" type coops. (Note that the basic difference between these two coop models is that, under an AFA-type coop, harvesters would be linked to processors while, under a Dooley-Hall coop, harvesters and processors would not be linked.) Finally, the AP recommended that the Council reaffirm its earlier policy statement that catch history in the crab fisheries beyond December 31, 1998 may not count in future rationalization programs, including a fishery cooperative system.

After consideration of the staff's discussion paper, the AP's recommendations and public testimony, the Council adopted a suite of alternatives, elements and options for rationalization of the BSAI crab fisheries (see Section 1.2 for the complete list of elements and options). The Council motion included the recommendations of the AP, amended as follows:

- 1. Addition of a detailed set of options for a co-op program as another alternative to the IFQ program and in addition to the AFA-style and Dooley-Hall style coops recommended by the AP. The set of options referenced many of the elements and options proposed for the IFQ program but included additional options unique to cooperatives. This coop alternative was further amended to include (a) an option to protect traditional crew share percentages, (b) a minimum of 4 (instead of 3) vessels per coop for confidentiality reasons, and (c) options for accounting for discards under a coops.
- 2. Addition of another option to grant harvesting QS to persons that own catch history and/or fishing rights of BSAI crab vessels (as opposed to granting QS to persons that own a certified vessel) and an accompanying option that describes the basis for the distribution of harvesting QS.
- 3. Addition of the period 1996-2000 (best 4 seasons) as additional options for harvester qualifying periods for the opilio, Bristol Bay red king and brown king crab fisheries. These same options were also added under the qualifying period options for processor quota shares. These options were included in order to address the need for the Council to give consideration to recent participants in the crab fisheries.
- 4. Clarification of the definition of sea time to require sea time in the applicable commercial fisheries in a harvesting capacity.

- 5. Clarification of the options for catcher/processors as follows: (a) eligible catcher/processors would be granted processing quota shares based on their processing history, (b) catcher/processors may purchase catcher vessel QS but may not process any crab harvested with such QS, and (c) catcher/processors may sell processed or unprocessed crab.
- 6. Reinstatement of the options for treatment of discards under IFQs which the AP had eliminated.
- 7. For the option to allocate 0-20% of harvesting QS to eligible skippers/crew, addition of an option to distribute the QS based on a point system presented during public testimony. The option to protect traditional crew share percentages (which had been eliminated by the AP) based on the Canadian Groundfish Development Authority Code of Conduct was also reinstated.
- 8. Under regionalization, addition of an option for a third region (an Aleutian Region) with an option to split deliveries of Aleutian Islands brown king crab and Adak red king crab into a western and eastern area, with a suboption to require up to 50% of the western Aleutian Islands brown king crab processed in the western region.
- 9. Addition of an option to sunset the program after 5 years or 7 years.
- 10. Addition of options for allocations to the existing CDQ program, including (1) no change, (2) expand existing CDQ program to all BSAI crab species included in rationalization program, (3) increase allocation for all crab species to 12.5%, and (5) for Aleutian Islands brown king crab, allocate the percentage of the resource unutilized during the qualifying period to the community of Adak.
- 11. Expansion of the options for program review to require "an analysis of post-rationalization impacts to coastal communities in terms of adverse economic impacts and options for mitigating those impacts."

As part of the Council's discussion of the motion, the Council's representative from ADF&G articulated the State's perspective on the overall goals of rationalization. From the State's perspective, the first priority is conservation and sustainable fisheries management, and achieving economic efficiency in the harvest of the fishery resources off Alaska. There is a need, however, to balance the goals of conserving stocks, reducing bycatch, minimizing habitat impacts and achieving full utilization of the fishery resources. Thus, any strategies for more sustainable and efficient fisheries should contain explicit mechanisms to provide measurable reductions in bycatch on a fishery-by-fishery basis and measurable reductions in habitat impacts, including allowances to transition to lower-impact gear types where possible. The State also considers safety to be a major concern. Additionally, the State considers that any rationalization program needs to include the harvesting sector, processing sectors and communities, and protect their interests to the extent possible. Regarding communities, the economies of fishery-dependent communities should be protected but also allowed to grow with new opportunities. Other goals highlighted by the State's representative included measures to maintain an owner-operated fleet by Alaskans, controls on excessive consolidation and vertical integration, and provisions that recognize the contributions of skippers and crew members.

The Council also identified several additional issues that should be addressed in the analysis as follows: (1) effects of the proposed crab rationalization alternatives on other fisheries, such as salmon and herring processing and tendering activities; (2) the potential downside of excessive economic planning by government, including the decrease in asset values and decrease in the value of quota shares that may result from some of

the proposed measures; and (3) in general, the adverse impacts to society and individuals that would result from diminishing economic freedom.

Finally, the Council reaffirmed its earlier policy statement (made at its October 1999 meeting) that catch history in the crab fisheries beyond December 31, 1998 may not count in future rationalization programs, including a fishery cooperative system.

Appendix 1-2 Bering Sea Crab Rationalization Harvest Data Base

Harvest information was taken from State of Alaska electronic fish ticket data from the ADF&G Shellfish database. These data were received through the Alaska Fisheries Information Network (AKFIN) after the Commercial Fisheries Entry Commission's (CFEC) permit matching and gross earnings estimate processes had been run. The data reflect the ADF&G electronic shellfish data base as of:

Year	Date
2001	August 3,2001
2000	January 6, 2001
1999	November 13, 2000
1998	November 13, 2000
1997	November 13, 2000
1996	November 13, 2000
1995	November 13, 2000
1994	November 13, 2000
1993	November 13, 2000
1992	November 13, 2000
1991	November 13, 2000

King and Tanner crab species from the Bering Sea were selected, excepting *Lithodes couesi* (scarlet king crab) , *T. Tanneri*, and *T. angularis* . Harvests associated with CDQ, test fishing, cost recovery harvests, home pack/personal use, and confiscated deliveries were removed from the data base.

Table 1 Summary of Bering Sea Crab Data Excluded from Data Base Species Harvest Type Pounds

Species	Harvest Type	Pounds
King	CDQ Harvests	1,846,498
King	Confiscated	195,602
King	Deadloss	3,314,037
King	Personal Use	205,652
King	Test Fishing	1,240,672
King	Total	6,802,461
Tanner	CDQ Harvests	22,866,679
Tanner	Confiscated	120,675
Tanner	Deadloss	20,800,964
Tanner	Personal Use	67,192
Tanner	Test Fishing	26,345
Tanner	Total	43,881,855

Season totals from the Bering Sea crab rationalization data base were compared to the season totals shown in SAFE documents in Table 2 to evaluate the fish ticket data's completeness.

Table 2 Comparison of Harvests from SAFE Documents to Bering Sea Crab Rationalization Data Base, by Fishery and Season

	Season	Safe reports (incl Crab	rationalization Dif	ference Pe	ercent Saf	e figures from:
Fishery	Scuson	- `	base + excluded	incremee 1	orcent Sur	o figures from:
i isiici y		dead				
AI BRN	1991-1992	7,702,141	7,676,192	25,949	0.3%	TABLE 4.3 1999 CRAB SAFE
AI BRN	1992-1993	6,291,197	6,247,869	43,328	0.7%	TABLE 4.3 1999 CRAB SAFE
AI_BRN	1993-1994	5,551,143	5,551,143	0	0.0%	TABLE 4.3 1999 CRAB SAFE
AI BRN	1994-1995	8,128,297	8,106,912	21,385	0.3%	TABLE 4.3 1999 CRAB SAFE
AI BRN	1995-1996	6,890,906	6,960,725	-69,819	-1.0%	TABLE 4.3 1999 CRAB SAFE
AI BRN	1996-1997	5,854,236	5,771,036	83,200	1.4%	TABLE 4.3 1999 CRAB SAFE
AI_BRN	1997-1998	5,945,682	5,973,868	-28,186	-0.5%	TABLE 4.3 1999 CRAB SAFE
AI BRN	1998-1999	4,939,248	4,939,248	0	0.0%	TABLE 4-4 2001 CRAB SAFE
AI_BRN	1999-2000	5,838,788	5,838,788	0	0.0%	TABLE 4-4 2001 CRAB SAFE
AI_BRN	2000-2001	6,018,761	6,100,125	81,364	-1.	
AI_DKIV	2000-2001	0,010,701	0,100,123	01,504	-1.	Preliminary/F. Bowers
BB_RED	1991	17,177,894	16,956,415	221,479	1.3%	TABLE 5-1 1999 CRAB SAFE
BB_RED	1992	8,043,018	7,996,040	46,978	0.6%	TABLE 5-1 1999 CRAB SAFE
BB_RED	1993	14,628,639	14,475,680	152,959	1.0%	TABLE 5-1 1999 CRAB SAFE
BB_RED	1996	8,405,614	8,344,921	60,693	0.7%	TABLE 5-1 1999 CRAB SAFE
BB RED	1997	8,756,490	8,756,065	425	0.0%	TABLE 5-1 1999 CRAB SAFE
BB RED	1998	14,233,063	14,233,063	0	0.0%	TABLE 5-1 1999 CRAB SAFE
BB RED	1999	11,090,930	11,070,612	20,318	0.2%	TABLE 5-1 2001 CRAB SAFE
BB_RED	2000	7,546,145	7,544,523	1,622	0.0%	TABLE 5-1 2001 CRAB SAFE
BS_OPIE	1991	328,647,269	328,647,269	0	0.0%	TABLE 5-24 1999 CRAB SAFE
BS OPIE	1992	315,302,034	315,156,256	145,778	0.0%	TABLE 5-24 1999 CRAB SAFE
BS OPIE	1993	230,787,000	230,747,760	39,240	0.0%	TABLE 5-24 1999 CRAB SAFE
BS OPIE	1994	149,775,765	149,792,718	-16,953	0.0%	TABLE 5-24 1999 CRAB SAFE
BS OPIE	1995	75,252,677	75,294,328	-41,651	-0.1%	TABLE 5-24 1999 CRAB SAFE
BS_OPIE	1996	65,712,797	65,696,173	16,624	0.0%	TABLE 5-24 1999 CRAB SAFE
BS_OPIE	1997	119,543,024	119,543,024	0	0.0%	TABLE 5-24 1999 CRAB SAFE
BS_OPIE	1998	243,341,381	243,341,381	0	0.0%	TABLE 5-24 1999 CRAB SAFE
BS OPIE	1999	184,529,821	184,529,821	0	0.0%	TABLE 5-25 2001 CRAB SAFE
BS_OPIE	2000	30,774,838	30,716,208	58,630	0.2%	TABLE 5-25 2001 CRAB SAFE
BS_TANN	1991-1992	31,796,381	31,794,086	2,295	0.0%	TABLE 5-23 1999 CRAB SAFE
BS_TANN	1992-1993	35,130,866	35,130,866	0	0.0%	TABLE 5-23 1999 CRAB SAFE
BS_TANN	1993-1994	16,891,320	16,893,368	-2,048	0.0%	TABLE 5-23 1999 CRAB SAFE
BS TANN	1994	7,766,886	7,766,886	0	0.0%	TABLE 5-23 1999 CRAB SAFE
BS_TANN	1995	4,233,061	4,228,510	4,551	0.1%	TABLE 5-23 1999 CRAB SAFE
BS_TANN	1996	1,806,077	1,802,710	3,367	0.2%	TABLE 5-23 1999 CRAB SAFE
PR_RB	1993	2,607,634	2,586,438	21,196	0.8%	TABLE 5-6 1999 CRAB SAFE
PR_RB	1994	1,338,953	1,338,953	0	0.0%	TABLE 5-6 1999 CRAB SAFE
PR_RB	1995	2,138,627	2,282,653	-144,026	-6.7%	TABLE 5-6 1999 CRAB SAFE
PR_RB	1996	1,137,336	1,131,684	5,652	0.5%	TABLE 5-6 1999 CRAB SAFE
PR_RB	1997	1,269,192	1,263,920	5,272	0.4%	TABLE 5-6 1999 CRAB SAFE
PR_RB	1998	1,027,361	1,026,671	690	0.1%	TABLE 5-6 1999 CRAB SAFE
STM BLU	1991	3 272 066	3 272 066	0	0.0%	TABLE 5-9 1999 CRAB SAFE
_	1991	3,372,066	3,372,066			TABLE 5-9 1999 CRAB SAFE
STM_BLU STM_BLU	1992	2,474,080	2,475,916	-1,836 -3,168	-0.1%	TABLE 5-9 1999 CRAB SAFE
_	1993 1994	2,999,921	3,003,089		-0.1%	TABLE 5-9 1999 CRAB SAFE
STM_BLU		3,764,262	3,764,262	$0 \\ 0$	0.0%	TABLE 5-9 1999 CRAB SAFE
STM_BLU	1995	3,166,093	3,166,093		0.0%	
STM_BLU	1996	3,080,916	3,078,959	1,957	0.1%	TABLE 5-9 1999 CRAB SAFE TABLE 5-9 1999 CRAB SAFE
STM_BLU	1997	4,649,660	4,649,660	600	0.0%	
STM_BLU	1998	2,868,965	2,869,655	-690	0.0%	TABLE 5-9 1999 CRAB SAFE

Yearly data were merged with annual ADF&G Intent to Operate files to append processor information (e.g. processor's name, type, processing vessel id, processing vessel name etc.) Processor codes not matching to the year in question were merged to an all-years intent file which contained the most recent information for a given code.

A data set of the season opening and closing dates¹ for each fishery was made using information from Crab SAFEs and Annual Management Reports. This information was matched with fish ticket records tp determine whether the landing date of the crab harvest fell within the season opening dates and to assign a season to the records. There were 23 out of season records identified throughout the time period..

Summary of Out of Season Landings, by Species, 1991-2001

	Records	Pounds
Red King Crab	7	58,116
Brown King Crab	10	64,192
T. bardi	1	0
T. opilio	5	217,017

After the identification of out of season harvests, Adak golden king crab harvest occurring east of 174 W longitude was reassigned to the Dutch Harbor golden king crab fishery. A new, hybrid closing date was constructed for the Dutch Harbor golden king crab datter (opening date of the Dutch Harbor fishery and closing date of the Adak fishery).

The next step was to merge the fish ticket data to the CFEC vessel license file, by year, and append vessel owner information to the record.

The identification of catcher processor records was done after this step, and after a few coding corrections to the Intent to Operate's processing vessel ADF&G numbers. Records were flagged as catcher/processor data if the ADF&G number of the harvesting vessel was equal to the ADF&G number of the processing vessel on each ticket. Records of catcher/vessels delivering to catcher/processors were also flagged . Information from the ADF&G registration lists was added at this time.

A special file was constructed to cross-referenced a consistent 'company' name to individual processor codes and also to cross- reference a consistent plant identifier for each facility across time.. This was important to accomplish because the existing Intent to Operate data did not have a satisfactory way to group or link processor codes for a given company across years and because a given plant could have had numerous State of Alaska processor codes throughout the period. This special file was also annotated with a 'Qualified' processor flag. This flag came from selecting the unique processor codes in the 1998 and 1999 shellfish Bering Sea fish ticket data, excepting non-commercial and CDQ harvest. The consistent company name from these records was then merged back to the base data so that all facilities of a company which had processed commercial Bering Sea crab in 1998 or 1999 were given a qualified processor flag of "YES".

Separate flags for boats meeting the general qualification period, the endorsement qualification period, and the general recency qualification period were added . The remaining two assigned flags were a vertical integration

¹The closing date of the fishery refers to the date on which fishing must cease. Since the fleet has a period of time after the close to offload the crab a second date was added to cover this period.

flag (and company) for vessels owned by processors, as identified by the processing sector (10 percent or more)..

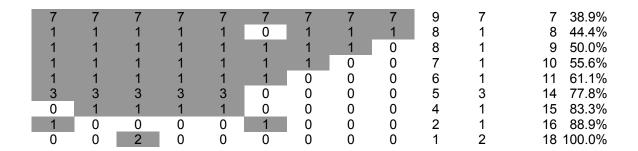
A regionalization flag was created as follows: Information from the ADF&G ITO file was used to assign shore based processors to a port. These ports were then assigned to either a northern or a southern region. Industry supplied the seasonal location(s) for the floating processors. Because responses were not received from all processors, some of the harvests delivered to the floating sector could not be assigned to a region.

The resulting data base can be summarized in terms of qualified/unqualified vessels or processors, region of processing,, company ownership of catcher vessels, catcher-processors/catcher-vessel harvests, catcher vessel ownership, etc.

Appendix 2-1 BSAI Crab Vessel Participation Tables Bering Sea *C. opilio* Qualifed Catcher Vessels

Bering Sea						1000	4000	2000			0 1/ 1	0 0/
1992	1993	1994	1995	1996	1997	1998	1999	2000	Years	UniqueVessels		
155	155	155	155	155	155	155	155	155	9	155	155	63.5%
0	7	7	7	7	7	7	7	7	8	7	162	66.4%
2	2	0	2	2	2	2	2	2	8	2	164	67.2%
2	2	2	0	2	2	2	2	2	8	2	166	68.0%
2	2	2	2	2	0	2	2	2	8	2	168	68.9%
1	1	1	1	1	1	0	1	1	8	1	169	69.3%
1	1	1	1	1	1	1	0	1	8	1	170	69.7%
9	9	9	9	9	9	9	9	0	8	9	179 105	73.4%
0	0	6	6	6	6	6	6	6	7	6	185	75.8%
1	0	0	1		1	1	1	1	7	1	186	76.2%
1	0	1	1	0	1	1	1	1	7	1	187	76.6%
•	1	1	0	0	1	1	1	1	7	1	188	77.0%
0	1	1	1	1	1	1	1	0	7	1	189	77.5%
1	1	0	1		1	1	1	0	7	1	190	77.9%
1	1	1	1	0	1	1	1	0	7	1	191	78.3%
1	1	1	1	1	1	0	1	0	7	1	192	78.7%
1	1		1	1	1	1	0	0	7	1	193	79.1%
0	0	1	1	1	0	1	1	1	6	1	194	79.5%
1	1	1	0	0	0	1	1	1	6	1	195	79.9%
0	1	1	1	1	0	0	1	1	6	1	196	80.3%
1	1	1	1	0	0	0	1	1	6	1	197	80.7%
1	1	1	1	0	0	1	0	1	6	1	198	81.1%
2	2	2	2	2	2	0	0	0	6	2	200	82.0%
1	0	0	0	0	1	1	1	1	5	1	201	82.4%
1	•	3	-	0	1	0	0	1	5	1	202	82.8%
3	3		3	3	0	0	0	0	5	3	205	84.0%
-	0	0	0	0	0	1	1	1	4	1	206	84.4%
0	0	-	0	1	0	0	1	1	4	1	207	84.8%
0	0	0	0	1	1	0	0	1	4	1	208 209	85.2%
1	0	0	0	0	0	1	1	0 0	4	1		85.7%
•	0 2			0					4	1	210	86.1%
0	0	2	2	2	0	0	0 0	0	4	2	212 213	86.9% 87.3%
0	0	0	0	1	0	0 0	0	0	4 3	1	213	87.3% 87.7%
0	1	1	-	-	-	0			3	1	214	88.1%
1	1		0	0	0	-	1	0		1		
1	0	0	0	0 0	0 0	0	0	0 0	3 3	1	216 217	88.5% 88.9%
	1		•	4	4					1		
0 0		0	0	0	1	0	0 0	0 0	3	1	218 219	89.3% 89.8%
0	0 0	1	1	1	0	0	0	0	3 3	1	219	90.2%
0	0	0	0	0	0	0	1	1	2	1	221	90.2 %
	0	0	1	0	0	0	0		2	1	222	90.0%
0 0	0	1	0	0	0		0	1	2	1	223	
0	0	0	0	0	0	0	1	0	2	1	224	91.4% 91.8%
0	0	1	0	1	0	0	0	0	2	1	225	92.2%
0	0	2	2	0	0	0	0	0	2	2	227	93.0%
1	0	0	1	0	0	0	0	0	2	1	228	93.4%
0	2	2	0	0	0	0	0	0	2	2	230	94.3%
0	0	0	0	0	0	0	0	4	1	4	234	95.9%
0	0	0	0	0	0	0	2	0	1	2	236	96.7%
0	0	0	0	2	0	0	0	0	1	2	238	97.5%
0	0	2	0	0	0	0	0	0	1	2	240	98.4%
0	2	0	0	0	0	0	0	0	1	2	240	99.2%
2	0	0	0	0	0	0	0	0	1	2	242	100.0%
198	204	215	211	208	200	200	206	197	ı	244	<u> </u>	100.0 /0
198	ZU4	Z 1 5	∠ 11	ZUŎ	∠∪∪	Z UU	200	197		Z4 4		

Bering	Sea C.	opilio (Qualifed	d Catch	er/Prod	essors			
1992	1993	1994	1995	1996	1997	1998	1999	2000	Years Unique Cum Cum
									Vessels Vessels Percen



Bering Sea *C. opilio* Qualifed Catcher/Processors

Catche	r/Proce	ssors										
1992	1993	1994	1995	1996	1997	1998	1999	2000	Years	Unique Cum	(Cum
										Vessels Vess	els F	Percent
7	7	7	7	7	7	7	7	7	9	7	7	38.9%
1	1	1	1	1	0	1	1	1	8	1	8	44.4%
1	1	1	1	1	1	1	1	0	8	1	9	50.0%
1	1	1	1	1	1	1	0	0	7	1	10	55.6%
1	1	1	1	1	1	0	0	0	6	1	11	61.1%
3	3	3	3	3	0	0	0	0	5	3	14	77.8%
0	1	1	1	1	0	0	0	0	4	1	15	83.3%
1	0	0	0	0	1	0	0	0	2	1	16	88.9%
0	0	2	0	0	0	0	0	0	1	2	18	100.0%
15	15	17	15	15	11	10	9	8		18		

Bristol Bay Red King Crab Qualified Catcher Vessels

										Unique	Cum	Cum
1992	1993	1994	1995	1996	1997	1998	1999	2000	Years	Vessels	Vessels	Percent
131	131	0	0	131	131	131	131	131	7	131	131	51.4%
30	30	0	0	0	30	30	30	30	6	30	161	63.1%
5	0	0	0	5	5	5	5	5	6	5	166	65.1%
0	4	0	0	4	4	4	4	4	6	4	170	
4	4	0	0	4	4	4	0	4	6	4	174	68.2%
3	3	0	0	3	0	3	3	3	6	3	177	
4	4	0	0	4	4	4	4	0	6	4	181	71.0%
0	6	0	0	0	6	6	6	6	5	6	187	73.3%
4	0	0	0	0	4	4	4	4	5	4	191	74.9%
4	4	0	0	0	0	4	4	4	5	4	195	76.5%
0	0	0	0	2	2	2	2	2	5	2	197	77.3%
2	2	0	0	0	2	2	0	2	5	2	199	78.0%
0	1	0	0	1	0	1	1	1	5	1	200	78.4%
1	1	0	0	0	1	0	1	1	5	1	201	78.8%
8	8	0	0	0	8	8	8	0	5	8	209	82.0%
0	3	0	0	3	3	3	3	0	5	3	212	83.1%
2	0	0	0	2	2	2	2	0	5	2	214	
8	8	0	0	8	8	8	0	0	5	8	222	87.1%
2	2	0	0	0	0	2	0	2	4	2	224	87.8%
1	0	0	0	0	0	1	1	1	4	1	225	88.2%
0	1	0	0	0	1	0	1	1	4	1	226	88.6%
1	0	0	0	1	0	0	1	1	4	1	227	89.0%
0	1	0	0	0	1	1	0	1	4	1	228	89.4%
1	0	0	0	0	1	1	0	1	4	1	229	89.8%
0	2	0	0	0	2	2	2	0	4	2	231	90.6%
1	1	0	0	0	0	1	1	0	4	1	232	91.0%
1	1	0	0	0	1	1	0	0	4	1	233	91.4%
2	2	0	0	2	2	0	0	0	4	2	235	92.2%
0	0	0	0	1	1	0	0	1	3	1	236	92.5%
1	0	0	0	1	0	0	1	0	3	1	237	92.9%
1	1	0	0	0	0	0	1	0	3	1	238	93.3%
1	1	0	0	0	0	1	0	0	3	1	239	93.7%
3	3	0	0	3	0	0	0	0	3	3	242	94.9%
0	0	0	0	0	0	0	1	1	2	1	243	95.3%
0	1	0	0	0	0	0	0	1	2	1	244	95.7%
0	0	0	0	0	1	1	0	0	2	1	245	96.1%
0	1	0	0	0	1	0	0	0	2	1	246	
4	4	0	0	0	0	0	0	0	2	4	250	
0	5	0	0	0	0	0	0	0	1	5	255	100.0%
225	235	0	0	175	225	232	217	207		255		

From BSAI Crab Rationalization Data Base, 2001-1

Bristol Bay Red King Crab Qualified Catcher/Processors

	Ť									Unique	Cum	Cum
1992	1993	1994	1995	1996	1997	1998	1999	2000	Years	Vessels	Vessels	Percent
2	2	0	0	2	2	2	2	2	7		2 2	12.5%
2	2	0	0	0	2	2	2	2	6		2 4	25.0%
0	1	0	0	1	1	1	1	1	6		1 5	31.3%
0	1	0	0	0	1	1	1	1	5		1 6	37.5%
0	2	0	0	0	2	2	0	0	3		2 8	50.0%
0	0	0	0	0	0	1	1	0	2		1 9	56.3%
1	0	0	0	1	0	0	0	0	2		1 10	62.5%
4	4	0	0	0	0	0	0	0	2		4 14	87.5%
0	2	0	0	0	0	0	0	0	1		2 16	100.0%
9	14	0	0	4	8	9	7	6		1	6	

								Cumulative	
1991-1992	1992-1993		1994	1995	1996		Vessels		Percent
116	116	116	116	116	116	6	116	116	
20	20	20	0	20	20	5	20	136	
11	11	11	11	0	11	5	11	147	
0	2	2	2	2	2	5	2	149	
2	2	0	2	2	2	5	2	151	59.7%
10	10	10	10	10	0	5	10	161	63.6%
11	11	11	0	0	11	4	11	172	
2	2	0	0	2	2	4	2	174	
0	1	1	1	0	1	4	1	175	
0	1	0	1	1	1	4	1	176	
1	0	0	1	1	1	4	1	177	
11	11	11	11	0	0	4	11	188	
0	6	6	6	6	0	4	6	194	
6	6	6	0	6	0	4	6	200	
3	3	0	0	0	3	3	3	203	
2	0	2	0	0	2	3	2	205	
0	0	1	1	0	1	3	1	206	
0	1	1	0	0	1	3	1	207	
1	0	0	0	1	1	3	1	208	
16	16	16	0	0	0	3	16	224	
0	0	1	1	1	0	3	1	225	
0	1	0	1	1	0	3	1	226	
1	0	1	0	1	0	3	1	227	
0	3	3	0	3	0	3	3	230	
0	0	1	0	0	1	2	1	231	91.3%
0	0	0	0	1	1	2	1	232	
0	7	7	0	0	0	2	7	239	
2	0	2	0	0	0	2	2	241	95.3%
6	6	0	0	0	. 0	2	6	247	
0	0	1	0	1	0	2	1	248	
0	0	3	0	0	0	1	3	251	99.2%
0	1	0	0	0	0	1	1	252	
1	0	0	0	0	0	11	1	253	100.0%
222	237	233	164	175	177		253		

Bering Sea C.bairdi Qualifed Catcher/Processors

								Cumulative	Cumulative
1991-1992	1992-1993	1993-1994	1994	1995	1996	Years	Vessels	Vessels	Percent
1	1	1	1	1	1	6	1	1	6.3%
1	1	1	0	1	1	5	1	2	12.5%
4	4	4	4	4	0	5	4	6	37.5%
1	1	1	0	0	1	4	1	7	43.8%
2	2	2	0	2	0	4	2	9	56.3%
1	1	1	1	0	0	4	1	10	62.5%
0	0	1	1	1	0	3	1	11	68.8%
0	1	1	0	1	0	3	1	12	75.0%
1	0	1	0	1	0	3	1	13	81.3%
1	1	1	0	0	0	3	1	14	87.5%
1	0	0	0	0	1	2	1	15	93.8%
1	1	0	0	0	0	2	1	16	100.0%
14	13	14	7	11	4		16		

							Unique	Cumulative	Cumulative
1993	1994	1995	1996	1997	1998	Years	Vessels	Vessels	Percent
14	14	14	14	14	14	6	14		
3	3	3	3	3	0	5	3		
0	1	1	1	1	1	5	1	18	
1	1	1	0	1	1	5	1	19	
5	0	5	5	5	5	5	5		
5	5	0	5	5	5	5	5		
7	7	7	7	0	7	5	7	• • • • • • • • • • • • • • • • • • • •	
3	3	3	3	0	. 0	4	3		
1	1	1	0	1	0	4	1	40	33.3%
1	0	1	1	0	1	4	1	41	34.2%
1	0	1	0	1	1	4	1	42	35.0%
0	2	2	2	0	2	4	2	44	36.7%
2	2	2	0	0	2	4	2	46	38.3%
0	2	2	2	0	0	3	2	48	40.0%
1	0	1	1	0	0	3	1	49	40.8%
1	1	0	1	0	0	3	1	50	41.7%
10	10	10	0	0	0	3	10	60	50.0%
1	0	1	0	1	0	3	1	61	50.8%
1	1	0	0	1	0	3	1	62	51.7%
0	2	2	0	2	0	3	2	. 64	53.3%
0	1	1	0	0	1	3	1	65	54.2%
0	11	11	0	0	0	2	11	76	63.3%
6	0	6	0	0	0	2	6	82	68.3%
12	12	0	0	0	0	2	12	94	78.3%
1	0	0	0	0	1	2	1	95	79.2%
0	14	0	0	0	0	1	14	109	
11	0	0	0	0	0	1	11	120	100.0%
87	93	75	45	35	41		120		

Pribilof Red King Crab Qualified Catcher/Processors

							Unique	Cumulative	Cumulative
1993	1994	1995	1996	1997	1998	Years	Vessels	Vessels	Percent
2	0	0	0	0	0	1	2	2	100.0%

Pribilof Blue King Crab Qualified Catcher Vessels

							Unique	Cum	Cum
1993	1994	1995	1996	1997	1998	Years	Vessels	Vessels	Percent
0	0	20	20	20	20	4	20	20	24.1%
0	0	9	9	0	9	3	9	29	34.9%
0	0	0	4	4	4	3	4	33	39.8%
0	0	2	0	2	2	3	2	35	42.2%
0	0	4	4	4	0	3	4	39	47.0%
0	0	3	0	0	3	2	3	42	50.6%
0	0	0	1	0	1	2	1	43	51.8%
0	0	6	6	0	0	2	6	49	59.0%
0	0	4	0	4	0	2	4	53	63.9%
0	0	0	0	0	1	1	1	54	65.1%
0	0	0	1	0	0	1	1	55	66.3%
0	0	27	0	0	0	1	27	82	98.8%
0	0	0	0	1	0	1	1	83	100.0%
0	0	75	45	35	40		83		

									Unique	Cumulative	Cumulative
1993	1994	1995	1996	1997	1998	1999	2000	Years	Vessels	Vessels	Percent
0	0	1	0	0	0	0	0	1	1	1	100.0%

Saint Matthews Blue King Crab Qualified Catcher Vessels

Odini Watt	news blue r	ting Orab Q	daillea oa	torici vesse	<i>7</i> 10		Unique	Cum	Cum
1993	1994	1995	1996	1997	1998	Years	Vessels	Vessels	Percent
31	31	31	31	31	31	6	31	31	22.46%
9	0	9	9	9	9	5	9		28.99%
0	5	5	5	5	5	5	5		
4	4	0	4	4	4	5	4		
3	3	3	3	0	3	5	3		
1	1	1	1	1	0	5	1		
0	0	7	7	7	7	4	7		
6	0	0	6	6	6	4	6	66	
0	3	0	3	3	3	4	3	69	50.00%
3	3	0	0	3	3	4	3		
0	1	1	0	1	1	4	1	73	52.90%
0	1	1	1	0	1	4	1	74	53.62%
1	1	0	1	0	1	4	1	75	54.35%
0	1	1	1	1	0	4	1	76	55.07%
1	1	1	0	1	0	4	1	77	55.80%
1	1	1	1	0	0	4	1	78	56.52%
0	0	0	7	7	7	3	7	85	61.59%
1	0	0	0	1	1	3	1	86	62.32%
0	0	1	1	0	1	3	1	87	63.04%
0	1	0	1	0	1	3	1	88	63.77%
1	0	0	1	0	1	3	1	89	64.49%
0	1	1	0	0	1	3	1	90	65.22%
1	0	1	0	0	1	3	1	91	65.94%
0	0	1	1	1	0	3	1	92	
1	1	0	0	1	0	3	1	93	67.39%
0	3	3	3	0	0	3	3		
2	0	2	2	0	0	3	2		
3	3	3	0	0	0	_ 3	3		73.19%
0	0	0	0	5	5	2	5		
0	_ 0	0	3	0	3	2	3		
1	0	0	0	0	1	2	1		
0	0	0	3	3	0	2	3		
0	2	0	0	2	0	2	2		
0	5	5	0	0	0	2	5		
5	5	0	0	0	0	_ 2	5		
0	0	0	0	0	4	1	4		
0	0	0	0	2	0	1	2		94.93%
0	0	1	0	0	0	1	1	132	
0	1	0	0	0	0	1	1	133	
5	0	0	0	0	0	1	5	138	100.00%
80	78	79	95	94	100		138		

Saint Matthews Blue King Crab Qualified Catcher/Processors

							Unique	Cum	Cum
1993	1994	1995	1996	1997	1998	Years	Vessels	Vessels	Percent
0	0	0	1	1	1	3	1	1	16.7%
1	1	1	0	0	0	3	1	2	33.3%
1	0	0	1	0	0	2	1	3	50.0%
1	1	0	0	0	0	2	1	4	66.7%
0	2	0	0	0	0	1	2	6	100.0%
3	4	1	2	1	1		6		

Eastern Aleutians Islands (Dutch Harbor) Golden King Crab Catcher/Vessels

1992-	1993-	1994-	1995-	1996-	1997-	1998-	1999-	2000-		Unique	Cum	Cum
1993	1994	1995	1996	1997	1998	1999	2000	2001	Years	'Vessels	Vessels	Percent
0	0	2	0	0	0	0	0	0	1	2	2	11.8%
0	0	1	0	1	0	0	0	0	2	1	3	17.6%
0	0	1	1	0	0	0	0	0	2	1	4	23.5%
0	1	1	0	0	0	0	0	0	2	1	5	29.4%
1	1	0	0	0	0	0	0	0	2	1	6	35.3%
0	0	0	0	0	0	1	1	1	3	1	7	41.2%
0	0	0	0	0	1	1	1	1	4	1	8	47.1%
1	1	1	1	0	0	0	0	0	4	1	9	52.9%
1	1	0	0	1	0	0	1	1	5	1	10	58.8%
0	0	1	1	1	1	1	1	1	7	1	11	64.7%
0	3	3	3	3	3	3	3	3	8	3	14	82.4%
1	0	1	1	1	1	1	1	1	8	1	15	88.2%
2	2	2	2	2	2	2	2	2	9	2	17	100.0%
6	9	13	9	9	8	9	10	10	•	17		

Western Aleutian Islands (Adak) Red King Crab Qualified Catcher Vessels

1992- 1993	1993- 1994	1994- 1995	1995- 1996	Years	Vessels	Cum Vessels	Cum Percent
0	1	1	1	3	1	1	3.7%
3	3	3	0	3	3	4	14.8%
0	2	0	2	2	2	6	22.2%
0	1	1	0	2	1	7	25.9%
1	0	1	0	2	1	8	29.6%
1	1	0	0	2	1	9	33.3%
0	0	11	0	1	11	20	74.1%
0	3	0	0	1	3	23	85.2%
4	0	0	0	1	4	27	100.0%
9	11	17	3		27		

Eastern Aleutian Islands (Dutch Harbor) Golden King Crab Qualified Catcher/Processors

 alci ici/i	1000330	13										
1992-	1993-	1994-	1995-	1996-	1997-	1998-	1999-	2000-	Years	Vessels	Cum	Cum
1993	1994	1995	1996	1997	1998	1999	2000	2001			Vessels	Percent
0	0	0	0	0	0	0	1	0	1	1	1	33.3%
2	0	0	0	0	0	0	0	0	1	2	3	100.0%
2	0	0	0	0	0	0	1	0		3		

Western Aleutian Islands (Adak) Red King Crab Qualified Catcher Vessels

* 000010							
1992-	1993-	1994-	1995-	Years	Vessels	Cum	Cum
1993	1994	1995	1996			Vessels	s Percent
1	1	1	1	4	1	1	50.0%
0	0	1	0	1	1	2	100.0%
1	1	2	1		2		

Western Aleutian Islands (Adak) Golden King Crab Qualified Catcher Vessels

VVCStCIII	Alculial	Islands	(Muak)	JOIGCII IX	ing Orab	Qualific	u Oatone	71 V C 3 3 C 1	<u> </u>			
1992-	1993-	1994-	1995-	1996-	1997-	1998-	1999-	2000-	Years	Unique	Cum	Cum
1993	1994	1995	1996	1997	1998	1999	2000	2001		'Vessels	Vessel	s Percent
0	1	1	1	1	1	0	1	1	7	1	1	5.0%
0	0	1	1	1	1	0	1	1	6	1	2	10.0%
1	1	1	0	1	1	0	1	1	6	1	3	15.0%
0	1	1	0	1	0	0	1	1	5	1	4	20.0%
0	1	1	1	0	0	0	1	1	5	1	5	25.0%
0	0	1	1	1	1	0	0	1	5	1	6	30.0%
1	1	1	1	0	1	0	1	0	5	1	7	35.0%
1	0	1	0	1	0	0	1	1	4	1	8	40.0%
0	1	0	1	1	0	0	1	0	4	1	9	45.0%
0	0	0	0	1	0	0	1	1	3	1	10	50.0%
0	2	2	2	0	0	0	0	0	3	2	12	60.0%
1	1	1	1	0	0	0	0	0	3	1	13	65.0%
0	1	0	1	0	0	0	0	0	2	1	14	70.0%
0	2	2	0	0	0	0	0	0	2	2	16	80.0%
2	2	2	0	0	0	0	0	0	2	2	18	90.0%
0	2	0	0	0	0	0	0	0	1	2	20	100.0%
6	16	15	10	8	5	0	9	8		20		

Western Aleutian Islands (Adak) Golden King Crab Qualified Catcher Processors

1992-	1993-	1994-	1995-	1996-	1997-	1998-	1999-	2000-	Years	Vessel	Cum	Cum
1993	1994	1995	1996	1997	1998	1999	2000	2001		S	Vessels	Percent
2	0	0	0	0	0	0	0	0	1	2	2	66.7%
1	1	1	1	1	1	1	1	1	9	1	3	100.0%
3	1	1	1	1	1	1	1	1		3		

Appendix 2-2 Harvest and Ex-vessel Revenues for BSAI fisheries

Figure 2-2-1. Total pounds, exvessel gross revenue, and number of vessels for qualified and non-qualified vessels by type and season for Bering Sea C. *opilio* fishery.

			Qualified			Non-Qualified			Total	
			Exvessel Gross			Exvessel Gross			Exvessel Gross	
Season	Vessel Type	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels
1991	ALL	277,038,196	\$140,106,737	186	48,145,037	\$24,361,389	34	325,183,233	\$164,468,126	220
1992	ALL	263,316,684	\$134,738,987	211	49,522,720	\$25,355,633	39	312,839,404	\$160,094,620	250
1993	ALL	192,794,833	\$145,560,104	219	36,378,975	\$27,466,127	35	229,173,808	\$173,026,231	254
1994	ALL	126,131,616	\$166,974,142	231	21,861,339	\$28,692,576	42	147,992,955	\$195,666,718	273
1995	ALL	68,241,554	\$158,792,881	226	5,763,805	\$13,374,605	27	74,005,359	\$172,167,486	253
1996	ALL	62,298,495	\$85,311,579	221	2,064,663	\$2,828,588	13	64,363,158	\$88,140,168	
1997	ALL	110,175,845	\$86,818,566	211	7,003,838	\$5,519,024	15	117,179,683	\$92,337,590	226
1998	ALL	221,759,908	\$125,296,748	209	18,673,742	\$10,550,665	20	240,433,650	\$135,847,412	229
1999	ALL	165,749,984	\$162,932,235	214	16,928,523	\$16,640,738	27	182,678,507	\$179,572,974	241
2000	ALL	27,356,045	\$50,471,904	205	2,902,125	\$5,354,421	23	30,258,170	\$55,826,325	228
1991	C/P	46,247,487	\$23,400,401	17	20,713,480	\$10,481,021	9	66,960,967	\$33,881,421	26
1992	C/P	29,497,134	\$15,102,533	15	24,796,443	\$12,695,779	15	54,293,577	\$27,798,312	30
1993	C/P	25,224,431	\$19,044,446	15	16,452,662	\$12,421,760	12	41,677,093	\$31,466,207	27
1994	C/P	15,259,838	\$20,356,533	17	8,564,205	\$11,313,773	7	23,824,043	\$31,670,305	24 19
1995	C/P	6,415,864	\$14,725,914	15	1,909,708	\$4,508,821	4	8,325,572	\$19,234,735	19
1996	C/P	10,622,330	\$14,552,592	15	0	\$0	0	10,622,330	\$14,552,592	15
1997	C/P	*	*	11	*	*	1	12,395,552	\$9,767,695	12
1998	C/P	*	*	10	*	*	2	16,301,645	\$9,210,430	12
1999	C/P	*	*	9	*	*	1	9,934,426	\$9,765,541	10
2000	C/P	*	*	8	*	*	1	1,350,744	\$2,492,123	9
1991	C/V	230,790,709	\$116,706,337	174	27,431,557	\$13,880,368	27	258,222,266	\$130,586,704	201
1992	C/V	233,819,550	\$119,636,454	198	24,726,277	\$12,659,854	24	258,545,827	\$132,296,308	222
1993	C/V	167,570,402	\$126,515,658	204	19,926,313	\$15,044,367	23	187,496,715		227
1994	C/V	110,871,778	\$146,617,609	215	13,297,134	\$17,378,804	35	124,168,912		250
1995	C/V	61,825,690	\$144,066,967	211	3,854,097	\$8,865,784	23	65,679,787		234
1996	C/V	51,676,165	\$70,758,987	208	2,064,663		13	53,740,828		221
1997	C/V	98,738,242	\$77,805,735	200	6,045,889	\$4,764,161	14	104,784,131	\$82,569,895	214
1998	C/V	208,147,517	\$117,605,746	200	15,984,488	\$9,031,236	18	224,132,005		218
1999	C/V	156,454,954	\$153,795,221	206	16,289,127	\$16,012,212	26	172,744,081		232
2000	C/V	26,139,185	\$48,226,797	197	2,768,241	\$5,107,405	22	28,907,426		219

Figure 2-2-2. Total pounds, exvessel gross revenue and number of vessels for qualified and non-qualified vessels by type and season for Bristol Bay red king crab fishery.

		Qualified			Nor	n-Qualified	Total			
						Exvessel			Exvessel	
	Vessel		Exvessel Gross			Gross			Gross	
Season	Type	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels
1991	ALL	14,203,706	\$46,403,508	244	2,645,856	\$8,644,012	54	16,849,562	\$55,047,519	
1992	ALL	6,936,546	\$36,402,993	234	1,053,494	\$5,528,737	45	7,990,040	\$41,931,730	279
1993	ALL	12,575,720	. , ,	247	1,767,318	\$7,033,926	43	14,343,038	\$57,085,291	290
1996	ALL	7,842,994	\$31,591,580	179	476,617	\$1,919,813	15	-,,-	\$33,511,393	
1997	ALL	8,109,415	\$26,477,241	233	610,988	\$1,994,876	23	8,720,403	\$28,472,117	256
1998	ALL	12,700,690	\$33,428,216	241	1,419,797	\$3,736,906		, -, -	\$37,165,122	274
1999	ALL	9,763,590	\$61,178,655	224	1,186,266	\$7,433,143		10,949,856	\$68,611,798	
2000	ALL	6,709,374	\$32,332,474	213	758,866	\$3,656,975	31	7,468,240	\$35,989,449	244
1991	C/P	1,231,006	\$4,021,697	12	1,096,244	\$3,581,429	13	2,327,250	\$7,603,126	25
1992	C/P	385,502	\$2,023,115	9	240,428	\$1,261,766	6	625,930	\$3,284,881	15
1993	C/P	*	*	14	*	*	2	1,194,577	\$4,754,416	16
1996	C/P	236,566	\$952,888	4	0	\$0	0	236,566	\$952,888	4
1997	C/P	305,426	\$997,216	8	0	\$0	0	305,426	\$997,216	8
1998	C/P	*	*	9	*	*	2	780,643	\$2,054,652	11
1999	C/P	*	*	7	*	*	1	600,103	\$3,760,245	8
2000	C/P	209,181	\$1,008,043	6	0	\$0	0	209,181	\$1,008,043	6
1991	C/V	12,972,700	\$42,381,811	232	1,549,612	\$5,062,582	41	14,522,312	\$47,444,393	273
1992	C/V	6,551,044	\$34,379,879	225	813,066	\$4,266,970	39		\$38,646,849	264
1993	C/V	11,589,976	\$46,128,104	235	1,558,485	\$6,202,770	41	13,148,461	\$52,330,875	276
1996	C/V	7,606,428	\$30,638,692	175	476,617	\$1,919,813	15	8,083,045	\$32,558,505	190
1997	C/V	7,803,989	\$25,480,025	225	610,988	\$1,994,876	23	8,414,977	\$27,474,901	248
1998	C/V	12,020,973	\$31,639,201	232	1,318,871	\$3,471,268	31	13,339,844	\$35,110,469	263
1999	C/V	9,194,954	\$57,615,582	217	1,154,799	\$7,235,971	31	10,349,753	\$64,851,552	248
2000	C/V	6,500,193	\$31,324,430	207	758,866	\$3,656,975	31	7,259,059	\$34,981,406	238

Figure 2-2-3. Total pounds, exvessel gross revenue, and number of vessels for qualified and non-qualified vessels by type and season for Bering Sea C. *bairdi* fishery.

			Qualified		Non-Qualified			Total			
	Vessel		Exvessel Gross			Exvessel Gross			Exvessel Gross		
Season	Type	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels	
1991-1992	ALL	25,827,541	\$39,010,333	234	5,686,804	\$8,538,118	51	31,514,345	\$47,548,451	285	
1992-1993	ALL	30,360,268	\$50,041,533	249	4,426,643	\$7,255,484	45	34,786,911	\$57,297,017	294	
1993-1994	ALL	14,704,102	\$26,136,024	247	1,915,877	\$3,416,009	49	16,619,979	\$29,552,033	296	
1994	ALL	7,355,745	\$34,166,641	171	278,361	\$1,199,417	12	7,634,106	\$35,366,058	183	
1995	ALL	4,063,363	\$11,573,901	186	120,648	\$349,759	10	4,184,011	\$11,923,660	196	
1996	ALL	1,675,352	\$4,305,655	181	112,750	\$289,750	15	1,788,102	\$4,595,405	196	
1991-1992	C/P	3,415,988	\$5,138,908	14	3,026,720	\$4,547,074	15	6,442,708	\$9,685,982	29	
1992-1993	C/P	2,754,082	\$4,502,530	13	1,492,001	\$2,426,907	9	4,246,083	\$6,929,437	22	
1993-1994	C/P	*	*	14	*	*	3	2,072,386	\$3,695,064	17	
1994	C/P	*	*	7	*	*	2	630,984	\$2,830,811	9	
1995	C/P	370,209	\$1,073,236	11	0	\$0	0	370,209	\$1,073,236	11	
1996	C/P	15,316	\$39,362	4	0	\$0	0	15,316	\$39,362	4	
1991-1992	C/V	22,411,553	\$33,871,425	222	2,660,084	\$3,991,044	37	25,071,637	\$37,862,469	259	
1992-1993	C/V	27,606,186	\$45,539,003	237	2,934,642	\$4,828,577	38	30,540,828	\$50,367,580	275	
1993-1994	C/V	13,043,857	\$23,175,807	233	1,503,736	\$2,681,161	46	14,547,593	\$25,856,968	279	
1994	C/V	6,862,800	\$31,878,681	164	140,322	\$656,567	10	7,003,122	\$32,535,247	174	
1995	C/V	3,693,154	\$10,500,665	175	120,648	\$349,759	10	3,813,802	\$10,850,424	185	
1996	C/V	1,660,036	\$4,266,293	177	112,750	\$289,750	15	1,772,786	\$4,556,043	192	

Figure 2-2-4. Total pounds, exvessel gross revenue, and number of vessels for qualified and non-qualified vessels by type and season for Pribilof red king crab fishery.

			Qualified		Non	-Qualified		Total			
			Exvessel			Exvessel			Exvessel		
	Vessel		Gross			Gross			Gross		
Season	Type	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels	
1993	ALL	2,294,260	\$9,131,155	89	291,706	\$1,160,990	22	2,585,966	\$10,292,145	111	
1994	ALL	1,219,418	\$8,048,145	93	116,606	\$785,691	11	1,336,024	\$8,833,837	104	
1995	ALL	512,448	\$1,958,064	75	342,615	\$1,297,424	41	855,063	\$3,255,488	116	
1996	ALL	136,137	\$548,360	45	63,581	\$256,104	21	199,718	\$804,464	66	
1997	ALL	553,039	\$1,805,673	35	182,070	\$594,459	18	735,109	\$2,400,131	53	
1998	ALL	371,995	\$979,091	41	129,047	\$339,652	16	501,042	\$1,318,743	57	
1993	C/P	*	*	2	*	*	0	*	*	2	
1993	C/V	*	*	87	*	*	22	*	*	109	
1994	C/V	*	*	93	*	*	11	*	*	104	
1995	C/V	*	*	75	*	*	41	*	*	116	
1996	C/V	*	*	45	*	*	21	*	*	66	
1997	C/V	*	*	35	*	*	18	*	*	53	
1998	C/V	*	*	41	*	*	16	*	*	57	

Figure 2-2-5. Total pounds, exvessel gross revenue, and number of vessels for qualified and non-qualified vessels by type and season for Pribilof blue king crab fishery.

			Qualified		Non-	Qualified		Total			
						Exvessel			Exvessel		
	Vessel		Exvessel Gross			Gross			Gross		
Season	Type	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels	
1995	ALL	938,726	\$2,299,219	76	257,135	\$640,266	42	1,195,861	\$2,939,485	118	
1996	ALL	723,221	\$1,886,884	45	193,253	\$504,197	21	916,474	\$2,391,081	66	
1997	ALL	360,217	\$877,849	35	131,217	\$319,776	16	491,434	\$1,197,625	51	
1998	ALL	349,282	\$669,574	40	145,142	\$278,237	16	494,424	\$947,811	56	
1995	C/P	*	*	1	*	*	0	*	*	1	
1995	C/V	*	*	75	*	*	42	*	*	117	
1996	C/V	*	*	45	*	*	21	*	*	66	
1997	C/V	*	*	35	*	*	16	*	*	51	
1998	C/V	*	*	40	*	*	16	*	*	56	

Figure 2-2-6. Total pounds, exvessel gross revenue, and number of vessels for qualified and non-qualified vessels by type and season for St. Matthew blue king crab fishery.

		Qualified Non-Qualif			n-Qualified	ified			Total		
						Exvessel			Exvessel		
	Vessel		Exvessel Gross			Gross			Gross		
Season	Type	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels	
1991	ALL	2,339,768	\$5,928,972	51	815,839	\$2,067,336	17	3,155,607	\$7,996,308		
1992	ALL	2,205,585	\$6,896,864	154	268,495	\$839,584	20	2,474,080	\$7,736,448		
1993	ALL	2,686,189	\$7,720,107	82	313,732	\$901,666	10	2,999,921	\$8,621,773	92	
1994	ALL	3,432,831	\$13,861,627	82	284,732	\$725,895	5	3,717,563	\$14,587,522		
1995	ALL	2,772,016	\$6,790,651	80	303,886	\$756,676	10	3,075,902	\$7,547,327		
1996	ALL	2,443,818	\$6,375,921	97	596,948	\$1,557,437	25	3,040,766	\$7,933,359		
1997	ALL	3,641,843	\$8,875,172	95	796,552	\$1,941,197	22	4,438,395	\$10,816,369		
1998	ALL	2,197,756	\$4,213,098	101	651,818	\$1,249,535	30	2,849,574	\$5,462,634	131	
1991	C/P	*	*	5	*	*	4	*	*	9	
1992	C/P	*	*	4	*	*	3	*	*	7	
1993	C/P	*	*	3	*	*	0	*	*	3	
1994	C/P	*	*	4	*	*	2	*	*	6	
1995	C/P	*	*	1	*	*	0	*	*	1	
1996	C/P	*	*	2	*	*	1	*	*	3	
1997	C/P	*	*	1	*	*	0	*	*	1	
1998	C/P	*	*	1	*	*	1	*	*	2	
1991	C/V	*	*	46	*	*	13	*	*	59	
1992	C/V	*	*	150	*	*	17	*	*	167	
1993	C/V	*	*	80	*	*	10	*	*	90	
1994	C/V	*	*	78	*	*	3	*	*	81	
1995	C/V	*	*	79	*	*	10	*	*	89	
1996	C/V	*	*	95	*	*	24	*	*	119	
1997	C/V	*	*	94	*	*	22	*	*	116	
1998	C/V	*	*	100	*	*	29	*	*	129	

Figure 2-2-7. Total pounds, exvessel gross revenue, and number of vessels for qualified and non-qualified vessels by type and season for Eastern Aleutian Islands (Dutch Harbor) golden king crab fishery.

			Qualified		N	on-Qualified			Total			
			Exvessel			Exvessel			Exvessel			
	Vessel		Gross			Gross			Gross			
Season	Type	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels		
1991-1992	ALL	1,974,126	\$4,528,732	8	2,416,727	\$5,462,367	7	4,390,853	\$9,991,098	15		
1992-1993	ALL	2,043,019	\$4,159,592	8	2,386,525	\$4,868,158	5	4,429,544	\$9,027,751	13		
1993-1994	ALL	*	*	9	*	*	1	3,259,394	\$10,811,642	10		
1994-1995	ALL	3,303,883	\$11,363,276	13	1,275,940	\$4,527,827	6	4,579,823	\$15,891,104	19		
1995-1996	ALL	3,483,070	\$8,686,647	9	996,393	\$2,804,567	9	4,479,463	\$11,491,213	18		
1996-1997	ALL	2,268,056	\$5,020,547	9	837,603	\$1,858,443	5	3,105,659	\$6,878,990	14		
1997-1998	ALL	2,253,734	\$5,054,463	8	1,104,133	\$2,482,160	5	3,357,867	\$7,536,623	13		
1998-1999	ALL	2,209,045	\$4,183,032	9	955,975	\$1,830,274	5	3,165,020	\$6,013,306	14		
1999-2000	ALL	2,257,904	\$7,006,276	11	741,986	\$2,302,383	4	2,999,890	\$9,308,659	15		
2000-2001	ALL	2,088,183	\$6,991,796	10	998,707	\$3,344,395	5	3,086,890	\$10,336,191	15		
1991-1992	C/P	*	*	2	*	*	4	*	*	6		
1992-1993	C/P	*	*	2	*	*	3	*	*	5		
1995-1996	C/P	*	*	0	*	*	1	*	*	1		
1996-1997	C/P	*	*	0	*	*	2	*	*	2		
1997-1998	C/P	*	*	0	*	*	1	*	*	1		
1998-1999	C/P	*	*	1	*	*	0	*	*	1		
1991-1992	C/V	*	*	6	*	*	3	*	*	9		
1992-1993	C/V	*	*	6	*	*	2	*	*	8		
1993-1994	C/V	*	*	9	*	*	1	*	*	10		
1994-1995	C/V	*	*	13	*	*	6	*	*	19		
1995-1996	C/V	*	*	9	*	*	8	*	*	17		
1996-1997	C/V	*	*	9	*	*	5	*	*	14		
1997-1998	C/V	*	*	8	*	*	3	*	*	11		
1998-1999	C/V	*	*	9	*	*	4	*	*	13		
1999-2000	C/V	*	*	10	*	*	4	*	*	14		
2000-2001	C/V	*	*	10	*	*	5	*	*	15		

Figure 2-2-8. Total pounds, exvessel gross revenue, and number of vessels for qualified and non-qualified vessels by type and season for the Western Aleutian Islands (Adak) golden king crab fishery.

		Qualified			No	n-Qualified	Total			
			Exvessel			Exvessel			Exvessel	
	Vessel		Gross			Gross			Gross	
Season	Type	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels
1991-1992	ALL	*	*	8	*	*	3	3,143,391	\$6,719,363	11
1992-1993	ALL	1,546,165	\$3,053,918	9	130,745	\$258,469	5	1,676,910	\$3,312,387	14
1993-1994	ALL	*	*	16	*	*	2	2,119,067	\$8,403,487	18
1994-1995	ALL	2,460,486	\$7,631,290	15	794,630	\$2,449,951	13	3,255,116	\$10,081,240	28
1995-1996	ALL	1,293,107	\$2,950,817	10	872,834	\$1,995,799	8	2,165,941	\$4,946,616	
1996-1997	ALL	1,845,823	\$4,076,466	9	557,898	\$1,217,520	4	2,403,721	\$5,293,986	
1997-1998	ALL	*	*	6	*	*	3	2,405,622	\$4,765,475	
1998-1999	ALL	*	*	1	*	*	2	*	*	3
1999-2000	ALL	2,226,614	\$7,100,926	10	436,667	\$1,393,585	5	2,663,281	\$8,494,511	15
2000-2001	ALL	*	*	9	*	*	3	2,902,518	\$4,090,565	12
1991-1992	C/P	*	*	4	*	*	3	*	*	7
1992-1993	C/P	*	*	3	*	*	1	*	*	4
1993-1994	C/P	*	*	1	*	*	0	*	*	1
1994-1995	C/P	*	*	1	*	*	1	*	*	2
1995-1996	C/P	*	*	1	*	*	0	*	*	1
1996-1997	C/P	*	*	1	*	*	1	*	*	2
1997-1998	C/P	*	*	1	*	*	1	*	*	2
1998-1999	C/P	*	*	1	*	*	0		*	1
1999-2000	C/P	*	*	1	*	*	0		*	1
2000-2001	C/P	*	*	1	*	*	0	*	*	1
1991-1992	C/V	*	*	4	*	*	0	*	*	4
1992-1993	C/V	*	*	6	*	*	4	*	*	10
1993-1994	C/V	*	*	16	*	*	2		*	18
1994-1995	C/V	*	*	15	*	*	12	*	*	27
1995-1996	C/V	*	*	10	*	*	8	*	*	18
1996-1997	C/V	*	*	8	*	*	3	*	*	11
1997-1998	C/V	*	*	5	*	*	2		*	7
1998-1999	C/V	*	*	0	*	*	2	*	*	2
1999-2000	C/V	*	*	9	*	*	5	*	*	14
2000-2001	C/V	*	*	8	*	*	3	*	*	11

Figure 2-2-9. Total pounds, exvessel gross revenue, and number of vessels for qualified and non-qualified vessels by type and season for Western Aleutian Islands (Adak) red king crab fishery.

			Qualified		No	n-Qualified		Total		
			Exvessel			Exvessel			Exvessel	
	Vessel		Gross			Gross			Gross	
Season	Type	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels	Pounds	Revenue	Vessels
1991-1992	ALL	*	*	7	*	*	3	951,278	\$3,351,570	10
1992-1993	ALL	*	*	10	*	*	2	1,281,424	\$5,817,731	12
1993-1994	ALL	*	*	11	*	*	1	690,675	\$2,570,610	12
1994-1995	ALL	*	*	19	*	*	1	195,537	\$1,076,824	20
1995-1996	ALL	*	*	3	*	*	1	38,706	\$103,670	4
1991-1992	C/P	*	*	2	*	*	1	*	*	3
1992-1993	C/P	*	*	1	*	*	1	*	*	2
1993-1994	C/P	*	*	1	*	*	0	*	*	1
1994-1995	C/P	*	*	2	*	*	0	*	*	2
1995-1996	C/P	*	*	1	*	*	0	*	*	1
1991-1992	C/V	*	*	5	*	*	3	*	*	8
1992-1993	C/V	*	*	9	*	*	1	*	*	10
1993-1994	C/V	*	*	11	*	*	1	*	*	12
1994-1995	C/V	*	*	17	*	*	1	*	*	18
1995-1996	C/V	*	*	3	*	*	1	*	*	4

Appendix 2-3 First Wholesale Prices

The price that the first processor of crab receives for their product is known as the first wholesale price. In the crab fisheries, the best source of first wholesale price information is the Commercial Operator's Annual Report (COAR). Processors are required to file the COAR with the State of Alaska each year they submit an Intent to Operate application. The Intent to Operate application must be completed for a processor to operate in the State of Alaska.

Information in the COAR include the species that was processed, the product form that was produced, the price received for the product, and the quantity of the product produced on an annual basis. Weighted first wholesale prices can then be calculated by dividing the value of the product by the quantity all processors produced. Table 1 reports a summary of the weighted first wholesale prices by species and product. As can be seen from Table 2, shellfish sections accounted for the majority of the crab products produced in all species.

Other product forms were listed as being processed in the COAR data. Those product listed in the data are provided in Table 3. All of the products were excluded from the calculations presented in previous tables except for shellfish meat, shellfish sections, and whole crabs. Excluding those unusual data types helped to clean the prices that are reported, as they contained either very high or low prices in many cases. A hand check of the data was then used to check for other outliers. There was only two other cases where additional data were deleted from the analysis. Both were in the *C. bairdi* fishery where are price of more than \$44 per pound was reported. The total number of pounds deleted from the calculation was less than 58,000. The maximum and minimum prices of the products that were retained are reported in Table 4.

In general there has been a fairly substantial amount of price fluctuation over the 1991 to 2000 time period. First wholesale prices tended to peak in 1994 and 1995. Prices then declined from 1996 through 1998. However, in 1999 and 2000 prices increase to levels closer to those seen in 1994 and 1995.

Table 1: First Wholesale Crab Prices by Species and Product Form, 1991-2000 (prices have not been adjusted for inflation)

Species	Product	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Red King Crab	Shellfish Sections	\$ 6.57	\$ 8.24	\$ 7.43	\$ 11.90	\$ 10.01	\$ 8.53	\$ 6.15	\$ 5.52	\$ 11.25	\$ 9.11
_	Whole	\$ 6.47	\$ 9.35	\$ 6.64	\$ 5.75	\$ 5.73	\$ 4.59	\$ 6.42	\$ 3.83	\$ 10.69	\$ 7.74
Blue King Crab	Shellfish Sections	\$ 5.80	\$ 5.85	\$ 4.54	\$ 10.08	\$ 5.86	\$ 5.91	\$ 5.02	\$ 4.80	Conf.	Conf.
Golden King Crab	Shellfish Sections	\$ 5.89	\$ 4.83	\$ 4.59	\$ 6.15	\$ 5.79	\$ 5.18	\$ 4.75	\$ 4.24	\$ 6.90	\$ 7.22
	Whole	\$ 4.28	\$ 5.03	\$ 4.84	\$ 6.97	Conf.	Conf.	Conf.	\$ 4.90	\$ 3.79	\$ 4.60
C. bairdi (Tanner) Crab	Shellfish Sections	\$ 3.56	\$ 3.44	\$ 3.61	\$ 6.01	\$ 7.04	\$ 5.33	\$ 5.27	\$ 4.81	\$ 4.23	\$ 5.83
	Whole	\$ 3.72	\$ 3.98	\$ 3.88	\$ 5.42	\$ 6.06	\$ 3.56	\$ 2.95	\$ 2.95	\$ 3.71	\$ 3.33
C. opilio (snow) Crab	Shellfish Sections	\$ 1.80	\$ 1.88	\$ 2.43	\$ 3.57	\$ 5.28	\$ 3.25	\$ 2.13	\$ 2.03	\$ 2.92	\$ 4.16
	Whole	\$ 1.88	\$ 1.79	\$ 1.84	\$ 3.23	\$ 5.38	\$ 1.67	\$ 1.36	\$ 2.05	\$ 1.06	

Source: Commercial Operator's Annual Reports (1991-2000)

Note: The average price for each species included three product forms (shellfish meat, shellfish sections, and whole crabs). Those products were not always broken out separately in the table because of confidentiality issues.

Table 2: Pounds of product produced (in 1,000's) by species and product form, 1991-2000

Species	Product	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Red King Crab	Shellfish Sections	10,604	6,358	11,274	1,716	1,006	6,009	5,442	9,118	6,875	5,012
	Whole	636	335	107	124	152	81	51	114	135	63
Red King Crab (total)	11,240	6,694	11,381	1,841	1,158	6,091	5,493	9,232	7,010	5,075
Blue King Crab	Shellfish Sections	1,599	1,456	1,715	1,615	2,633	1,632	3,305	2,068	Conf.	Conf.
Blue King Crab	Total	1,616	1,480	1,797	1,743	2,643	1,658	3,311	2,081	Conf.	Conf.
Golden King	Shellfish Sections	3,216	2,804	3,308	4,305	4,647	4,712	2,697	2,812	3,000	3,649
Crab	Whole	12	3	12	6	Conf.	Conf.	Conf.	106	322	95
Golden King Cra	ab (total)	3,228	2,807	3,320	4,311	Conf.	Conf.	Conf.	2,918	3,322	3,744
C. bairdi	Shellfish Sections	23,829	23,516	16,359	11,744	4,479	2,297	1,071	1,335	1,078	817
(Tanner) crab	Whole	1,277	2,222	1,006	624	190	142	114	314	40	29
C. bairdi (Tanne	r) crab (total)	25,107	25,738	17,365	12,368	4,669	2,439	1,185	1,649	1,118	847
C. opilio	Shellfish		179,713	136,910	83,164	40,428	39,576	184,993	156,562	114,186	18,980
(Snow) crab	Whole	9,969	6,049	318	2,096	2,127	347	133	373	1,287	-
C.		178,368	185,762	137,229	85,260	42,555	39,923	185,127	156,935	115,473	18,980

Source: Commercial Operator's Annual Reports (1991-2000)

Note: "Conf." means there were not enough observations to report the information.

Table 3: Product forms reported in the 1991-2000 COAR data, by count and total weight

Product	Data	Total
Bait	# of Times Product was Reported	1
	Pounds of Product Reported	100
Bones	# of Times Product was Reported	3
	Pounds of Product Reported	6,091,338
H & G	# of Times Product was Reported	1
	Pounds of Product Reported	81,238
H & G, Eastern Cut	# of Times Product was Reported	1
	Pounds of Product Reported	241,980
H & G, Western Cut	# of Times Product was Reported	4
	Pounds of Product Reported	3,053
Other	# of Times Product was Reported	50
	Pounds of Product Reported	2,330,476
Roe	# of Times Product was Reported	1
	Pounds of Product Reported	31,113
Shellfish Meat	# of Times Product was Reported	42
	Pounds of Product Reported	1,657,482
Shellfish Sections	# of Times Product was Reported	1,498
	Pounds of Product Reported	1,327,137,265
Shrimp Tails	# of Times Product was Reported	17
	Pounds of Product Reported	351,898
Stomachs	# of Times Product was Reported	5
	Pounds of Product Reported	68,186
Whole	# of Times Product was Reported	424
	Pounds of Product Reported	31,499,249
Not Reported	# of Times Product was Reported	30
	Pounds of Product Reported	3,256,683

Table 4: Maximum and Minimum prices reported in the retained data (prices have not been adjusted for inflation).

Species	Product	Data	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Red King	Shellfish	Max Price	\$9.50	\$ 21.50	\$ 9.50	\$ 18.33	\$ 14.00	\$ 10.95	\$ 8.82	\$ 9.75	\$ 13.06	\$ 12.44
Crab	Sections	Min Price	\$ 0.70	\$ 4.60	\$ 3.80	\$ 1.50	\$ 5.00	\$ 2.25	\$ 4.09	\$ 2.41	\$ 5.45	\$ 7.00
	Whole	Max Price	\$ 7.88	\$ 10.26	\$ 7.50	\$ 13.96	\$ 12.83	\$ 8.49	\$ 8.36	\$ 7.86	\$ 15.03	\$ 12.00
		Min Price	\$ 3.60	\$ 4.76	\$ 3.27	\$ 3.00	\$ 4.08	\$ 0.34	\$ 3.50	\$ 1.29	\$ 5.40	\$ 6.47
Blue King	Shellfish	Max Price	\$ 9.00	\$ 7.63	\$ 7.82	\$ 14.35	\$ 11.04	\$ 8.00	\$ 8.03	\$ 6.00	Conf.	Conf.
Crab	Sections	Min Price	\$ 2.90	\$ 3.25	\$ 2.85	\$ 5.00	\$ 5.20	\$ 4.70	\$ 4.30	\$ 2.86	Conf.	Conf.
	Whole	Max Price	\$ 6.40	\$ 7.10	\$ 7.50	\$ 10.30	\$ 6.63	\$ 5.00	\$ 7.00	\$ 4.85	Conf.	Conf.
		Min Price	\$ 4.16	\$ 4.00	\$ 3.25	\$ 7.60	\$ 5.97	\$ 2.00	\$ 6.00	\$ 3.50	Conf.	Conf.
Golden	Shellfish	Max Price	\$8.75	\$ 10.50	\$ 10.50	\$ 10.00	\$ 9.62	\$ 8.46	\$ 7.50	\$ 7.19	\$ 13.00	\$ 10.20
King Crab	Sections	Min Price	\$ 3.50	\$ 4.39	\$ 3.20	\$ 4.23	\$ 4.71	\$ 3.81	\$ 4.22	\$ 3.96	\$ 3.45	\$ 5.19
	Whole	Max Price	\$ 5.94	\$ 6.41	\$ 5.50	\$ 7.95	Conf.	Conf.	Conf.	\$ 9.01	\$ 6.60	\$ 9.31
		Min Price	\$ 3.00	\$ 3.00	\$ 4.25	\$ 3.00	Conf.	Conf.	Conf.	\$ 4.52	\$ 3.08	\$ 4.25
C. bairdi	Shellfish	Max Price	\$ 5.80	\$ 6.39	\$ 5.05	\$ 10.05	\$ 9.94	\$ 7.50	\$ 6.26	\$ 5.50	\$ 5.78	\$ 6.55
	Sections	Min Price	\$ 0.46	\$ 0.12	\$ 1.61	\$ 3.54	\$ 5.56	\$ 2.60	\$ 3.25	\$ 1.79	\$ 1.74	\$ 2.76
	Whole	Max Price	\$ 5.47	\$ 6.18	\$ 5.50	\$ 9.55	\$ 7.01	\$ 6.24	\$ 6.00	\$ 4.86	\$ 4.43	\$ 5.50
		Min Price	\$ 1.65	\$ 0.88	\$ 1.95	\$ 0.65	\$ 0.99	\$ 2.00	\$ 2.00	\$ 2.50	\$ 3.06	\$ 3.19
C. opilio	Shellfish	Max Price	\$ 2.25	\$ 2.55	\$ 4.04	\$ 4.95	\$ 6.50	\$ 5.90	\$ 3.03	\$ 3.17	\$ 4.09	\$ 4.65
	Sections	Min Price	\$ 0.14	\$ 1.20	\$ 0.72	\$ 1.17	\$ 1.00	\$ 0.51	\$ 1.56	\$ 1.20	\$ 2.30	\$ 0.69
	Whole	Max Price	\$ 3.22	\$ 3.33	\$ 2.98	\$ 3.85	\$ 5.46	\$ 3.00	\$ 2.43	\$ 3.60	\$ 1.87	
		Min Price	\$ 0.70	\$ 1.55	\$ 0.70	\$ 1.36	\$ 3.48	\$ 1.25	\$ 1.00	\$ 0.66	\$ 0.98	

Source: Commercial Operator's Annual Reports (1991-2000)

Note: "Conf." means there were not enough observations to report the information.

Appendix 2-4 Vessel Ownership Information – Vertical Integration Vessels with processor or processor affiliate ownership greater than 10 percent

Company
Trident Seafoods
Dominator
Gladiator
Golden Dawn
Viking Explorer

Arcturus Aldebaran Majesty Royal Viking Farwest Leader Barbara J Billikin Bountiful

NW ENTERPRISE

WESTERN ENTERPRISE GLACIER ENTERPRISE ROYAL ENTERPRISE

Note: Vessels in CAPS are catcher/processors

Icicle Seafoods Viking Queen

Adventure Commodore Storm Petrel Anita J

Half Moon Bay Sunset Bay

Alyeska Seafoods Tuxedni

Bulldog Husky Labrador Retriever

Alaska Challenger

Kevleen K Sea Wolf

Note: These vessels are owned by shareholders or affiliates of Alyeska

Seafoods, not by the company Alyeska Seafoods

NorQuest Seafoods Beverly B

Cape Caution Southern Wind

Yardarm Knot WESTERWARD WIND

Note: Vessel is a catcher/processor

Royal Aleutian Seafoods Arctic Sea

North Sea Bering Sea Erla N Alaska Sea

Note: These vessels are owned by shareholders in Royal

Aleutian, not by the company Royal Aleutian

Snopak Products No crab eligible vessels

Peter Pan Seafoods No crab eligible vessels

Westward Seafoods No crab eligible vessels

Appendix 2-5 Ex-vessel Prices by Processor, Fishery, Season and Species

<u>Procedures:</u> The following procedures were used to determine the ex-vessel prices for the BSAI crab fisheries. Ex-vessel value information from ADF&G fish ticket data were first reviewed and then summarized by processor code, fishery, and season. Landed pounds and value of crab were used to calculate a weighted exvessel price for each processor. Summary records include the ex-vessel value of priced fish ticket data and the pounds of both the priced and unpriced deliveries. Since the data were summarized by State of Alaska processor code (i.e., at the plant level), there are multiple records for companies owning more than one processing facility.

<u>Preliminary Preparation of Selected ² Data:</u> An overview of the fish ticket data revealed fish tickets where the landed weights were distributed among several statistical areas but the ex-vessel values were not. For example, the 1994 ADF&G fish ticket for, BS *C. opilio*, below has a single landed value reported for harvests made in four statistical areas.

Ticket #	Item#	Pounds	Value	Price	Stat Area
nnnnn	001	48,422	0	0	Stat Area 1
	002	48,422	0	0	Stat Area 2
	003	48,422	0	0	Stat Area 3
	004	48.422	\$236,492	\$3.20	Stat Area 4

This ticket shows the equal apportionment of 193,688 pounds among the four statistical areas with only one of the records reporting a value of \$236,492 (equates to a price of \$3.20 per pound for that record). However, if the total value were divided by the total landed weights on all the items on that fish ticket (193,688) then the price for the BS *C. opilio* would be \$1.22, a value compatible with Commercial Fisheries Entry Commission average annual ex-vessel price estimates and with data from the Commercial Operator's Annual Reports. Therefore, when fish tickets had the above pattern, the values were applied to all pounds reported on the fish ticket.

The methodology used to combine the values and the landed weights on individual tickets was to count the number of times a monetary value occurred on a fish ticket and to also count the number of times a weight value was reported. When a ticket had only one dollar value and more than one weight value the weights were aggregated³ and the number of observations with apparently invalid prices decreased.⁴ The restructuring procedure was not without fault, however, as a review of the subsequently identified outliers contained some restructured tickets. However, the procedure was thought to correct a systematic problem encountered when estimating prices which is related to a legitimate method of reporting pounds and values on fish tickets.

Step1:

2

Fish ticket records associated with test fishing, confiscated catch, cost recovery harvests, CDQ harvests, and out of season harvests were excluded.

3

This situation occurred in the 1992-1995 period. There were 1,641 tickets containing 3,826 items.

4

There were 268 records with prices ranging from a lows of \$.002 and a high of \$1,285.050 before the restructuring and 83 records afterwards. See Table 2 for more detail.

After the above restructuring was completed, means, minimums, maximums and standard deviations of the price variable were calculated by fishery and season. The results are shown in Table 1. The landed weights were used to weight the prices, this was done because deadloss and discards would not be purchased by the plant and including those weights would skew the estimated prices. After the prices were calculated, a review of the resulting data revealed some prices of well over \$100 per pound and other prices which were well under \$0.01 per pound.

While these values were not terribly prevalent, they at times skewed a processor's data so greatly that the entire group of data for that processor was effectively unuseable. For this reason an arbitrary edit was done: All records with prices over \$10 were deleted along with all records with prices under \$0.75, with the exception of BS *C. opilio*, for which a minimum price of \$0.01 was used. (so that the lower valued old shell crab would be included). These limits were chosen after reviewing Table 1 and Commercial Fisheries Entry Commission weighted average annual ex-vessel price estimates. This edit removed 83 records across all fisheries in the time periods that were considered. Table 2 provides the range and number of prices deleted. Table 3 shows similar information for the prices that were retained.

Step2:

A weighted mean, minimum, maximum, and standard deviation was then computed on the retained records by fishery, season, species for each processor code. Again, landed weights were used as the weighting factor. A second price edit examined tickets whose price varied from the mean by a factor of ten. For example, if the mean price was \$3.00, then prices of under \$0.30 and over \$30 would be deemed likely data entry problems. BS *C. opilio* prices between \$0.01 and the mean were excepted by this edit because they appeared to reflect valid low prices for hard shell crab. Two records with prices over \$5.00 in the BS *C. opilio* fishery were excluded.

Step3:

A second weighted mean, minimum, maximum, standard deviation, and median were computed from the remaining data. These statistics were then merged back to records containing the total pounds delivered to each processor, the total priced pounds, the total numbers of vessels delivering to the processor, and the total number of vessels which had priced records. Assembling these data allowed the computation of the percent of pounds and records priced for each processor.

A summary of the pricing information by fishery and season is displayed in Table 4 (for all processors). Table 5 provides similar information but excludes catcher/processors and catcher/sellers because these types of operations do not generate typical ex-vessel prices.

Table 1: Observed Mean, Minmum, Maximum and Record Count of Unedited and Edited Prices, Weighted by Landed Weights By Fishery and Season

Fishery	Season	Unedited Mean	Edited Mean	Unedited Minimum	Edited Minimum	Unedited Maximum	Edited Maximum	Unedited Record Count	Edited Record Count	Rejected Record Count
ADK BRN	1991 1992	\$1.861	\$1.925	\$0.501	\$1.154	\$2.150	\$2.150	45	44	1
_	1992 1993	\$1.919	\$1.919	\$0.920	\$0.920	\$2.250	\$2.250	42	42	0
	1993 1994	\$2.896	\$2.740	\$2.107	\$2.107	\$259.701	\$4.900	86	82	4
		\$3.288	\$3.288	\$1.534	\$1.534	\$4.400	\$4.400	417	417	0
	1995 1996	\$2.091	\$2.087	\$1.700	\$1.700	\$23.000	\$2.322	479	478	1
	1996_1997	\$2.201	\$2.195	\$0.982	\$0.982	\$165.981	\$2.702	251	250	1
	1997_1998	\$2.138	\$2.138	\$1.800	\$1.800	\$3.000	\$3.000	275	275	0
	1998_1999	\$2.040	\$2.040	\$1.800	\$1.800	\$2.250	\$2.250	70	70	0
	1999_2000	\$3.129	\$3.129	\$2.747	\$2.747	\$3.600	\$3.600	415	415	0
	2000_2001	\$3.097	\$3.097	\$2.745	\$2.745	\$3.550	\$3.550	499	499	0
										7
ADK RED	1991 1992	\$3.097	\$3.097	\$2.500	\$2.500	\$3.500	\$3.500	9	9	0
_	1992 1993	\$4.746	\$4.746	\$4.250	\$4.250	\$5.500	\$5.500	12	12	0
	1993 1994	\$3.519	\$3.519	\$2.597	\$2.597	\$3.880	\$3.880	14	14	0
	1994 1995	\$5.491	\$5.491	\$4.501	\$4.501	\$5.519	\$5.519	27	27	0
	1995 <u></u> 1996	\$2.640	\$2.640	\$2.500	\$2.500	\$2.940	\$2.940	5	5	0
										0
BB RED	1992 1992	\$4.937	\$4.965	\$0.711	\$1.000	\$5.500	\$5.500	126	125	1
_	1993 1993	\$3.744	\$3.827	\$0.380	\$3.800	\$4.350	\$4.350	45	44	1
		\$4.013	\$4.013	\$4.000	\$4.000	\$4.500	\$4.500	219	219	0
	1997 1997	\$3.258	\$3.258	\$3.246	\$3.246	\$4.000	\$4.000	324	324	0
	1998_1998	\$2.644	\$2.611	\$2.000	\$2.000	\$26.000	\$3.000	381	380	1
	1999_1999	\$6.262	\$6.262	\$6.247	\$6.247	\$7.000	\$7.000	394	394	0
	2000_2000	\$4.807	\$4.807	\$4.797	\$4.797	\$5.000	\$5.000	365	365	0
										3
BS OPIE	1992 1992	\$0.501	\$0.500	\$0.005	\$0.015	\$5.634	\$1.600	1999	1996	3
	1993 1993	\$0.648	\$0.649	\$0.009	\$0.012	\$1.752	\$1.752	1349	1347	2
	1994 1994	\$1.256	\$1.252	\$0.133	\$0.133	\$11.700	\$2.058	995	994	1
	1995 1995	\$2.429	\$2.429	\$0.019	\$0.019	\$3.300	\$3.300	988	988	0
	1996 1996	\$1.326	\$1.326	\$0.500	\$0.500	\$2.000	\$2.000	1006	1006	0
	1997 1997	\$0.785	\$0.785	\$0.007	\$0.010	\$1.400	\$1.400	1698	1677	21
	1998 1998	\$0.561	\$0.561	\$0.007	\$0.010	\$0.955	\$0.955	2234	2226	8
	1999 1999	\$0.881	\$0.881	\$0.002	\$0.010	\$1.400	\$1.400	2251	2249	2
	2000_2000	\$1.846	\$1.846	\$0.850	\$0.850	\$2.050	\$2.050	459	459	0
										37

Table 1 (Continued): Observed Mean, Minmum, Maximum And Record Count of Unedited & Edited Prices, Weighted by Landed Weights by Fishery And Season

Table 1	(Continued):	observed Mean,	Minmum,	Maximum And	Record Count	or unearted	& Edited Pr			
								Unedited	Edited	Rejected
		Unedited	Edited	Unedited			Edited		Record	
Fishery	Season	Mean	Mean	Minimum	Minimum	Maximum	Maximum	Count	Count	Count
BS TANN	1991_1992	\$1.774	\$1.676	\$0.002	\$0.952	\$788.984	\$2.850	1375	1369	6
_	1992 1993	\$1.505	\$1.523	\$0.002	\$0.800	\$171.530	\$2.500	1627	1609	18
	1993 1994	\$1.778	\$1.794	\$0.020	\$0.764	\$19.500	\$2.450	559	554	5
	1994 1994	\$3.672	\$3.682	\$0.355	\$2.939	\$36.748	\$9.807	282	280	2
	1995 1995	\$2.949	\$2.774	\$2.713			\$3.476	185	183	2
	1996 1996	\$2.497	\$2.497				\$3.000	370	370	0
	–		,				,			
										33
DUT_BRN	1992_1992	\$2.232	\$2.232			\$2.250	\$2.250			0
	1993_1994	\$2.124	\$2.124			\$2.200	\$2.200		14	0
	1994_1995	\$3.885	\$3.885	\$3.000	\$3.000	\$8.000	\$8.000	87	87	0
	1995_1995	\$2.709	\$2.561	\$2.450		\$25.140	\$2.654	33	32	1
	1996 1996	\$2.234	\$2.234	\$1.100	\$1.100	\$2.340	\$2.340	238	238	0
	1997 1998	\$2.250	\$2.250	\$2.249	\$2.249	\$2.253	\$2.253	221	221	0
	1998 1999	\$1.868	\$1.868	\$1.799	\$1.799	\$2.801	\$2.801	155	155	0
	1999 2000	\$3.222	\$3.222	\$2.700	\$2.700	\$3.600	\$3.600	170	170	0
	2000 2001	\$3.503	\$3.503	\$3.298	\$3.298	\$3.550	\$3.550	165	165	0
	_									
										1
PRB BLU	1995_1995	\$2.923	\$2.923	\$2.400	\$2.400	\$3.000	\$3.000	168	168	0
1112_520	1996 1996	\$2.652	\$2.652		\$2.000	\$2.864	\$2.864	112	112	0
	1997 1997	\$2.817	\$2.817			\$4.000	\$4.000	116	116	0
	1998 1998	\$2.343	\$2.343			\$3.000	\$3.000	105	105	0
		, =	1=1010	,=	1=777	,	, , , , , ,			
										0
PRB RED	1993 1993	\$4.516	\$4.503	\$0.524	\$4.441	\$20.885	\$4.750	88	86	2
TIND_KED	1994 1994	\$6.446	\$6.446			\$7.500	\$7.500	138	138	0
	1995 1995	\$3.366	\$3.366	\$2.400		\$4.000	\$4.000	174	174	0
	1995_1995	\$2.759	\$2.759			\$3.253	\$3.253	108	108	0
	1990_1990	\$3.087	\$3.087			\$4.000	\$4.000	119	119	0
	1997_1997	\$2.391	\$2.391	\$2.150	\$2.150	\$3.400	\$3.400	113	113	0
	1990_1990	\$2.391	\$2.391	\$2.130	\$2.130	\$3.400	\$3.400	113	113	
										2
STM_BLU	1992_1992	\$2.756	\$2.791	\$0.192		\$3.250	\$3.250		71	1
	1993_1993	\$2.657	\$2.657	\$2.500	\$2.500	\$2.900	\$2.900	72	72	0
	1994_1994	\$4.150	\$4.150	\$3.750	\$3.750	\$4.500	\$4.500	126	126	0
	1995_1995	\$2.316	\$2.320	\$0.225	\$2.151	\$2.550	\$2.550	122	121	1
	1996_1996	\$2.200	\$2.200	\$1.781	\$1.781	\$2.900	\$2.900	190	190	0
	1997_1997	\$2.213	\$2.213	\$2.150	\$2.150	\$2.400	\$2.400	199	199	0
	1998_1998	\$1.867	\$1.867	\$1.600	\$1.600	\$2.251	\$2.251	300	300	0
										2
										85

Table 2: Ranges And Counts of Excluded Prices, by Fishery And Season

			Minimum	Maximum	Record	Minimum	Maximum	Record
F	ishery	Season	Low	Low	Count	High	High	Count
)))))))))))	())))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))
A	DK BRN	1991 1992	\$0.501	\$0.501	1	•		0

)))))))))))))))))))) \$0.002)))))))))))))))))))))))))))))))))))))))))))))	\$10.388)))) \$788.984	20
	1995_1995	\$0.225	\$0.225	1		•	0
STM_BLU	1992_1992	\$0.192	\$0.192	1			0
PRB_RED	1993_1993	\$0.524	\$0.524	1	\$20.885	\$20.885	1
DUT_BRN	1995_1995			0	\$25.140	\$25.140	1
	1995_1995			0	\$27.139	\$29.098	2
	1994_1994	\$0.355	\$0.355	1	\$36.748	\$36.748	1
	1993_1994	\$0.020	\$0.624	4	\$19.500	\$19.500	1
	1992_1993	\$0.002	\$0.727	13	\$10.658	\$171.530	5
BS_TANN	1991_1992	\$0.002	\$0.456	5	\$788.984	\$788.984	1
	1999_1999	\$0.002	\$0.009	2		•	0
	1998_1998	\$0.007	\$0.009	8		•	0
	1997_1997	\$0.007	\$0.009	21		•	0
	1994_1994		•	0	\$11.700	\$11.700	1
	1993_1993	\$0.009	\$0.009	2			0
BS_OPIE	1992_1992	\$0.005	\$0.005	1			0
	1998_1998			0	\$26.000	\$26.000	1
	1993_1993	\$0.380	\$0.380	1			0
BB_RED	1992_1992	\$0.711	\$0.711	1		•	0
	1996_1997			0	\$165.981	\$165.981	1
	1995_1996			0	\$23.000	\$23.000	1
	1993_1994			0	\$10.388	\$259.701	4

Table 3: Ranges And Counts of Retained Prices, by Fishery And Season

Fishery	Season	Minimum	Maximum	Record
)))))))))))))))	Price	Price	Count
ADK_BRN	1991_1992	\$1.154	\$2.150	44
	1992_1993	\$0.920	\$2.250	42
	1993_1994	\$2.107	\$4.900	82
	1994_1995	\$1.534	\$4.400	417
	1995_1996	\$1.700	\$2.322	478
	1996_1997	\$0.982	\$2.702	250
	1997_1998	\$1.800	\$3.000	275
	1998_1999	\$1.800	\$2.250	70
	1999_2000	\$2.747	\$3.600	415
	2000_2001	\$2.745	\$3.550	499
ADK_RED	1991_1992	\$2.500	\$3.500	9
	1992_1993	\$4.250	\$5.500	12
	1993_1994	\$2.597	\$3.880	14
	1994_1995	\$4.501	\$5.519	27
	1995_1996	\$2.500	\$2.940	5
BB_RED	1992_1992	\$1.000	\$5.500	125
	1993_1993	\$3.800	\$4.350	44
	1996_1996	\$4.000	\$4.500	219
	1997_1997	\$3.246	\$4.000	324
	1998_1998	\$2.000	\$3.000	380
	1999_1999	\$6.247	\$7.000	394
	2000_2000	\$4.797	\$5.000	365
BS_OPIE	1992_1992	\$0.015	\$1.600	1,996
	1993_1993	\$0.012	\$1.752	1,347
	1994_1994	\$0.133	\$2.058	994
	1995_1995	\$0.019	\$3.300	988
	1996_1996	\$0.500	\$2.000	1,006
	1997_1997	\$0.010	\$1.400	1,677
	1998_1998	\$0.010	\$0.955	2,226
	1999_1999	\$0.010	\$1.400	2,249
	2000_2000	\$0.010	\$2.050	459
BS_TANN	1991_1992	\$0.952	\$2.850	1,369
	1992_1993	\$0.800	\$2.500	1,609
	1993_1994	\$0.764	\$2.450	554
	1994_1994	\$2.939	\$9.807	280
	1995_1995	\$2.713	\$3.476	183
	1996_1996	\$2.249	\$3.000	370
DUT_BRN	1992_1992	\$2.150	\$2.250	12
	1993_1994	\$2.100	\$2.200	14
	1994_1995	\$3.000	\$8.000	87
	1995_1995	\$2.450	\$2.654	32
	1996_1996	\$1.100	\$2.340	238
	1997_1998	\$2.249	\$2.253	221
	1998_1999	\$1.799	\$2.801	155
	1999_2000	\$2.700	\$3.600	170
	2000_2001	\$3.298	\$3.550	165
PRB_BLU	1995_1995	\$2.400	\$3.000	168
	1996_1996	\$2.000	\$2.864	112
	1997_1997	\$2.749	\$4.000	116
	1998_1998	\$2.000	\$3.000	105

Table 3 (continued)

PRB RED	1993 1993	\$4.441	\$4.750	86
_	1994 1994	\$6.000	\$7.500	138
	1995 1995	\$2.400	\$4.000	174
	1996 1996	\$2.000	\$3.253	108
	1997 1997	\$3.000	\$4.000	119
	1998_1998	\$2.150	\$3.400	113
STM BLU	1992 1992	\$2.000	\$3.250	71
_	1993 1993	\$2.500	\$2.900	72
	1994 1994	\$3.750	\$4.500	126
	1995 1995	\$2.151	\$2.550	121
	1996 1996	\$1.781	\$2.900	190
	1997 1997	\$2.150	\$2.400	199
	1998_1998	\$1.600	\$2.251	300
))))))))))))))))	1))
		\$0.010	\$9.807	25,209
		70.010	77.007	40,400

Table 4: Overview of Weighted Fish Ticket Prices by Fishery and Season All Processor Types

Fishery)))))))))))	Season)))))))))))))	Total Landed Pounds))))))))))))))	Total Priced Pounds))))))))))))	Percent Pounds Priced	Value	Wtd Average Price)))))))))	Processors With Priced Data	All Processors
ADK_BRN	1990_1991 1991_1992 1992_1993 1993_1994 1994_1995 1995_1996 1996_1997 1997_1998 1998_1999 1999_2000 2000_2001	4,219,857 6,088,514 4,782,530 4,470,325 6,114,580 4,718,451 2,403,721 2,405,622 1,670,167 2,663,281 2,902,518	2,045,692 2,565,525 2,532,677 5,138,526 4,461,689 1,358,630 1,245,994 577,648 1,733,913 2,271,421	33.60 53.64 56.66 84.04 94.56 56.52 51.80 34.59 65.10 78.26	\$0 \$3,938,522 \$4,923,081 \$6,940,551 \$16,894,522 \$9,311,200 \$2,982,290 \$2,663,475 \$1,178,628 \$5,425,704 \$7,035,571	\$1.925 \$1.919 \$2.740 \$3.288 \$2.087 \$2.195 \$2.138 \$2.040 \$3.129 \$3.097	0 6 7 9 6 6 6 2 6	10 12 11 8 11 6 7 8 3 6 8
ADK_RED	1990_1991 1991_1992 1992_1993 1993_1994 1994_1995 1995_1996	169,102 951,278 1,281,424 690,675 195,537 38,706	262,384 277,956 451,830 119,584 21,531	27.58 21.69 65.42 61.16 55.63	\$0 \$812,632 \$1,319,074 \$1,590,137 \$656,608 \$56,834	\$3.097 \$4.746 \$3.519 \$5.491 \$2.640	0 6 6 8 7 3	3 11 9 10 10
BB_RED	1991_1991 1992_1992 1993_1993 1996_1996 1997_1997 1998_1998 1999_1999 2000_2000	16,849,562 7,990,040 14,343,038 8,319,611 8,720,403 14,120,487 10,949,856 7,468,240	3,480,048 1,430,810 7,702,893 8,232,026 12,974,819 10,059,005 6,558,477	43.55 9.98 92.59 94.40 91.89 91.86 87.82	\$0 \$17,279,406 \$5,475,256 \$30,908,556 \$26,821,854 \$33,881,052 \$62,988,135 \$31,525,323	\$4.965 \$3.827 \$4.013 \$3.258 \$2.611 \$6.262 \$4.807	0 15 6 12 16 17 16	56 41 39 17 25 27 23 23
BS_OPIE	1991_1991 1992_1992 1993_1993 1994_1994 1995_1996 1996_1996 1997_1997 1998_1998 1999_1999 2000_2000	325,183,233 312,839,404 229,173,808 147,992,955 74,005,359 64,363,158 117,179,683 240,433,650 182,678,507 30,258,170	218,982,153 160,562,569 110,311,435 58,564,396 49,997,836 102,965,597 218,439,523 173,675,517 27,969,602	70.00 70.06 74.54 79.14 77.68 87.87 90.85 95.07 92.44	\$0 \$109,410,709 \$104,157,710 \$138,159,392 \$142,271,956 \$66,295,848 \$80,851,245 \$122,587,985 \$153,041,662 \$51,638,940	\$0.500 \$0.649 \$1.252 \$2.429 \$1.326 \$0.785 \$0.561 \$0.881 \$1.846	0 31 34 32 29 28 26 29 26	69 64 68 59 52 44 42 44 36 28
BS_TANN	1990_1991 1991_1992 1992_1993 1993_1994 1994_1994 1995_1995 1996_1996	15,630,566 31,514,345 34,786,911 16,619,979 7,634,106 4,184,011 1,788,102	7,151,670 23,116,968 10,826,581 6,195,418 2,869,483 1,531,372	22.69 66.45 65.14 81.15 68.58 85.64	\$0 \$11,984,597 \$35,210,839 \$19,418,231 \$22,811,242 \$7,958,508 \$3,823,354	\$1.676 \$1.523 \$1.794 \$3.682 \$2.773 \$2.497	0 34 38 28 14 14	62 69 71 51 28 27 19
DUT_BRN	1991_1991 1992_1992 1993_1994 1994_1995 1995_1995 1996_1996 1997_1998 1998_1999 1999_2000 2000_2001	1,445,730 1,323,924 908,136 1,720,359 1,926,953 3,105,659 3,357,867 3,165,020 2,999,890 3,086,890	540,208 908,136 1,650,819 1,578,323 3,105,659 2,981,457 2,925,915 2,864,096 3,086,890	40.80 100.00 95.96 81.91 100.00 88.79 92.45 95.47 100.00	\$0 \$1,205,709 \$1,928,674 \$6,412,973 \$4,041,812 \$6,938,551 \$6,708,306 \$5,466,986 \$9,227,924 \$10,812,630	\$2.232 \$2.124 \$3.885 \$2.561 \$2.234 \$2.250 \$1.868 \$3.222 \$3.503	0 3 5 6 4 5 4 6 6	8 8 5 6 5 5 6 7 7
PRB_BLU	1995_1995 1996_1996 1997_1997 1998_1998	1,195,861 916,474 491,434 494,424	1,067,353 847,326 474,799 474,338	89.25 92.45 96.62 95.94	\$3,120,211 \$2,246,802 \$1,337,639 \$1,111,172	\$2.923 \$2.652 \$2.817 \$2.343	8 10 12 13	12 11 12 15
PRB_RED	1993_1993 1994_1994 1995_1995 1996_1996 1997_1997 1998_1998	2,585,966 1,336,024 855,063 199,718 735,109 501,042	1,757,623 1,181,948 728,576 193,003 720,799 498,845	67.97 88.47 85.21 96.64 98.05 99.56	\$7,915,389 \$7,618,788 \$2,452,168 \$532,459 \$2,224,857 \$1,192,881	\$4.503 \$6.446 \$3.366 \$2.759 \$3.087 \$2.391	13 15 9 9 12 13	17 16 12 10 12 14
STM_BLU	1991_1991 1992_1992 1993_1993 1994_1994	3,155,607 2,474,080 2,999,921 3,717,563	1,005,578 1,652,041 3,118,422	40.64 55.07 83.88	\$0 \$2,806,627 \$4,389,127 \$12,941,504	\$2.791 \$2.657 \$4.150	0 9 11 16	15 19 16 22

1995 1995	3,075,902	2,894,251	94.09	\$6,715,195	\$2.320	10	11
1996 1996	3,040,766	2,242,369	73.74	\$4,933,888	\$2.200	11	15
1997 1997	4,438,395	4,426,626	99.73	\$9,796,323	\$2.213	12	13
1998_1998	2,849,574	2,544,794	89.30	\$4,752,367	\$1.867	12	14

Table 5: Overview of Weighted Fish Ticket Prices by Fishery and Season (Catcher Processors and Catcher/sellers Excluded)

Fishery)))))))))	Season)))))))))))))	Total Landed Pounds	Total Priced Pounds	Percent Pounds Priced	Value		Processors With Priced Data	All Processors
ADK_BRN	1990_1991 1991_1992 1992_1993 1993_1994 1994_1995 1995_1996 1996_1997 1997_1998 1998_1999 1999_2000 2000_2001	1,796,371 2,431,180 3,632,021 3,905,984 5,190,845 4,392,003 1,327,012 1,249,377 577,648 1,697,941 1,993,874	1,661,596 2,322,078 2,532,677 5,122,144 4,390,761 1,326,944 1,245,994 577,648 1,697,764 1,993,874	68.35 63.93 64.84 98.68 99.97 99.99 99.73 100.00 99.99	\$0 \$3,297,409 \$4,497,049 \$6,940,551 \$16,832,515 \$9,190,622 \$2,951,160 \$2,663,475 \$1,178,628 \$5,326,299 \$6,272,350	\$1.984 \$1.937 \$2.740 \$3.286 \$2.093 \$2.224 \$2.138 \$2.040 \$3.137 \$3.146	0 4 5 7 8 5 5 6 2 5 7	4 8 7 9 5 5 6 2 5 7
ADK_RED	1991_1992 1992_1993 1993_1994 1994_1995 1995_1996	266,383 806,524 465,651 98,102 22,272	187,170 250,950 451,830 82,612 21,531	70.26 31.12 97.03 84.21 96.67	\$624,597 \$1,197,547 \$1,590,137 \$453,539 \$56,834	\$3.337 \$4.772 \$3.519 \$5.490 \$2.640	5 5 8 6 3	8 7 9 8 3
BB_RED	1991_1991 1992_1992 1993_1993 1996_1996 1997_1997 1998_1998 1999_1999 2000_2000	14,360,990 7,186,419 13,053,109 7,897,131 8,493,704 12,634,107 10,018,299 7,172,614	3,480,048 1,369,365 7,702,893 8,232,026 12,324,131 9,638,028 6,505,761	48.43 10.49 97.54 96.92 97.55 96.20 90.70	\$0 \$17,279,406 \$5,241,765 \$30,908,556 \$26,821,854 \$32,184,792 \$60,357,026 \$31,271,920	\$4.965 \$3.828 \$4.013 \$3.258 \$2.612 \$6.262 \$4.807	0 15 5 12 16 14 14	32 24 24 13 18 16 15
BS_OPIE	1991_1991 1992_1992 1993_1993 1994_1994 1995_1995 1996_1996 1997_1997 1998_1998 1999_1999 2000_2000	257,523,354 259,777,128 187,346,715 126,126,831 66,087,115 54,738,161 106,126,849 224,132,005 172,639,663 28,318,872	218,311,053 160,562,569 110,241,449 58,564,396 49,997,836 102,965,597 217,433,414 172,270,184 27,485,530	85.70 87.41 88.62 91.34 97.02 97.01	\$0 \$109,075,160 \$104,157,710 \$138,077,985 \$142,271,956 \$66,295,848 \$80,851,245 \$122,044,686 \$151,841,907 \$50,748,270	\$0.500 \$0.649 \$1.253 \$2.429 \$1.326 \$0.785 \$0.561 \$0.881 \$1.846	0 30 34 31 29 28 26 28 24	38 34 38 36 34 30 29 29 25 19
1990_1991	13,633,1 1991_1992 1992_1993 1993_1994 1994_1994 1995_1995 1996_1996	25,177,190 30,354,794 14,524,022 7,003,122 3,831,529 1,754,467	7,142,652 23,115,953 10,800,149 6,195,418 2,869,483 1,531,372	\$ 28.37 76.15 74.36 88.47 74.89 87.28	\$11,968,818 \$35,208,809 \$19,370,649 \$22,811,242 \$7,958,508 \$3,823,354	\$1.676 \$1.523 \$1.794 \$3.682 \$2.773 \$2.497	0 36 33 37 27 14 14 13	BS_TANN 39 43 34 19 17 15
DUT_BRN	1991_1991 1992_1992 1993_1994 1994_1995 1995_1995 1996_1996 1997_1998 1998_1999 1999_2000 2000_2001	838,620 546,984 908,136 1,720,359 1,649,978 3,105,659 2,981,457 2,925,915 2,755,684 3,086,890	540,208 908,136 1,650,819 1,578,323 3,105,659 2,981,457 2,925,915 2,755,684 3,086,890	98.76 100.00 95.96 95.66 100.00 100.00 100.00 100.00	\$0 \$1,205,709 \$1,928,674 \$6,412,973 \$4,041,812 \$6,938,551 \$6,708,306 \$5,466,986 \$8,883,247 \$10,812,630	\$2.232 \$2.124 \$3.885 \$2.561 \$2.234 \$2.250 \$1.868 \$3.224 \$3.503	0 3 5 6 4 5 4 6 5	4 3 5 6 4 5 4 6 5 4 PRB BLU
1995_1995	1,154,3 1996_1996 1997_1997 1998_1998	1,067,35 909,713 491,434 494,424	92.46 840,565 474,799 474,338	\$3,120,21 92.40 96.62 95.94	\$2.923 \$2,233,280 \$1,337,639 \$1,111,172	\$2.657 \$2.817 \$2.343	10 9 12 13	10 12 15
PRB_RED	1993_1993 1994_1994 1995_1995 1996_1996 1997_1997 1998_1998	2,542,592 1,336,024 796,543 199,718 735,109 501,042	1,757,623 1,181,948 728,576 193,003 720,799 498,845	69.13 88.47 91.47 96.64 98.05 99.56	\$7,915,389 \$7,618,788 \$2,452,168 \$532,459 \$2,224,857 \$1,192,881	\$4.503 \$6.446 \$3.366 \$2.759 \$3.087 \$2.391	13 15 9 9 12 13	15 16 11 10 12 14
STM_BLU	1991_1991 1992_1992 1993_1993 1994_1994	2,166,613 2,087,645 2,834,296 3,366,915	980,865 1,652,041 3,072,690	46.98 58.29 91.26	\$0 \$2,752,901 \$4,389,127 \$12,749,429	\$2.807 \$2.657 \$4.149	0 8 11 15	6 11 13 16

1995 1995	3,022,097	2,894,251	95.77	\$6,715,195	\$2.320	10	10
1996 1996	2,866,705	2,119,826	73.95	\$4,664,292	\$2.200	10	12
1997 1997	4,426,626	4,426,626	100.00	\$9,796,323	\$2.213	12	12
1998 1998	2,645,489	2,544,794	96.19	\$4,752,367	\$1.867	12	12

Appendix 2-7 Review of Rationalization Programs

The Icelandic Individual Transferable Quota Program

Most of Iceland's fishing activity is regulated by an system of individual quotas. The first Icelandic individual quota system was developed in its herring fishery. In the late 1960s, the fishery was first threatened. After a few unsuccessful efforts to restrict harvests, declining stocks led managers to close the fishery. When the fishery was reopened in 1976, an individual quota program was implemented. Under the original program quotas were not transferable. Quotas were low (because of the poor stock levels) and often could not be fished economically. To address this shortcoming, quotas were made transferrable in 1979. A similar program was established for capelin in 1980. The shares in that fishery were made transferrable in 1986 (OECD, 2000a).

Prior to 1970, Iceland's cod fishery was dominated by foreign vessels. With the extension of the EEZ in 1975, Iceland sought to capitalize on its expanded fishing grounds by development of its fleets. The fleet grew rapidly, threatening stocks by the end of the 1970s. By the late 1970s, efforts were underway to constrain growth of the fleet. In 1984, an Individual Transferrable Quota (ITQ) program was implemented in all major groundfish fisheries, including the cod fishery. The program also restricted entry into the fishery permitting a new vessel to enter the fishery only when a larger or equal sized vessel was retired (OECD, 2000a). A 1999 ruling of the Supreme Court of Iceland eliminated the prohibition on entry finding that it was a violation of the constitutional right of equal access to employment. Under the ruling any registered vessel is permitted to obtain a license to enter the fishery. Vessels, however, require a valid quota to make any harvests (OECD, 2000b).

In the groundfish fishery, quota shares were issued based on fishing history in the three years preceding implementation of the program. Crews have been dissatisfied with the program, since only vessel owners received an initial allocation of quota shares (NRC, 1999). At the outset, annual quotas could be sold but the underlying quota shares (which create the entitlement to the annual quota) were not transferrable, except with transfer of the vessel or between vessels commonly owned. In the first few years of the program vessels could opt out of the program, instead adopting restrictions on effort. Those choosing to operate under the effort restrictions could reenter the catch quota system with a new harvest record established under the effort restrictions. Up to two-thirds of harvests were made under the effort restrictions in the years that the option was available. Vessels under 10 gross registered tons were initially exempt from the ITQ program and the entry moratorium. By 1988, the program was extended to cover all vessels over 6 gross registered tons (OECD, 2000a).

In 1990, a new fishing law was adopted that brought most of the remaining fisheries under ITQ management and extended the program indefinitely. The program instituted several changes to ITQ management. Vessels under 6 GRT were brought into the program for the first time. Quota shares were permitted to be sold outright—transfers were formerly limited to leasing of shares. A requirement that at least one half of a vessel's allocation must be fished every other year to retain the interest in those shares was created. To protect small communities, the law requires the Ministry of Fisheries to consult municipal governments and the local fishermen's unions before approving transfers of shares from a vessel located in one area to a vessel located in another area. Most transfers, however, have been permitted and trading is quite common under the program. For example, in 1993-94 season approximately 45 percent of the cod quota was traded and approximately 96 percent of the saithe quota was traded (NRC, 1999).

While the 1990 law was intended to make the program comprehensive by bringing vessels under 6 GRT into the ITQ program, those vessels can elect to fish in certain fisheries under options that restrict effort instead of under the ITQ program. Four different options exist, including one that is based solely on effort restrictions

(Icelandic Ministry of Fisheries, 2001). Current legislation will remove the effort restriction option for these vessels and incorporate them fully into the ITQ program (FNI, 2001).

ITQ management has had mixed results in protecting stocks in Iceland's fisheries. Herring harvests rose seven fold between 1975 and 1995. Cod harvests, however, were at historic lows in the early 1990s (NRC, 1999). The decline of the cod stock is likely attributable to two causes- the method of setting the TAC and the exemption of some catch from the TAC. Historically, the TAC was set by managers based on the biological recommendations of Marine Research Institute (MRI). Every year, managers have set the TAC higher than the MRI recommendation. TACs, on average, exceeded the recommendation by 12 percent during the late 1980s and early 1990s. The second source of overharvesting is the omission of certain catches from the TAC. Small vessels using certain gear types (including those participating in the effort restriction options) are not subject to an allocation under the TAC or may have their catch counted at a reduced rate against the TAC. As a consequence, harvests have exceeded the TAC by more than 12 percent on average. These two factors combined have led to the catches exceeding the TAC recommended by the MRI by an average of 26 percent. The condition of the stock may have suffered from these excessive harvests (OECD, 2000a). A new rule for specifying the cod TAC limits the TAC to 25 percent of the fishable biomass (Icelandic Ministry of Fisheries, 2001). Although the rule is intended to bring the TAC in line with scientific recommendations, the cod TAC has continued to be set in excess of the MRI recommendations (see OECD, 2000a and Icelandic Ministry of Fisheries, 2001).

In both the herring and the cod fishery, productivity has increased substantially. Between 1980 and 1996 the number of vessels participating in the herring fishery decreased from more than 200 to less than 30. During the same period, harvests increased almost three fold (NRC, 1999). Although the number of vessels active in the Icelandic fleets has declined, the fleet has grown in terms of gross tonnage (NRC, 1999). The two segments of the fleet that have grown are small vessels exempt from some of the barriers to entry created by the ITQ program and large trawlers that have been substituted for smaller vessels and have increased their interests in the fisheries by purchasing shares. The fleet is still considered to have excess capacity by some experts. Some of the overcapacity is attributed to the rule that permits vessels to enter the fleet only on withdrawal of another vessel. It is argued that this provision has created a value in vessels in excess of their performance in the fishery. The fleet is also thought to be overcapitalized in part because the TAC has been set too high. A larger fleet and more effort are thought to be required to harvest the diminished stock (OECD, 2000a).

The Icelandic groundfish ITQ system also is unique in its characterization of several species in "cod equivalents". In the program, vessels are issued a single quota expressed in quantities of cod. Since harvests are mixed species, each species can be quantified in its "cod equivalent," which is based on the market values of the different species in the fishery.

Quota shares have become more concentrated in recent years. In the last ten years, the largest 24 quota share holders have increased their holdings from one-quarter of the outstanding quota shares to more than half of the outstanding quota shares. Parliament has also responded to the consolidation by setting ownership caps of 10 percent in the cod and haddock fisheries and 20 percent in most other fisheries. The transferability of quota shares has caused a backlash from a few groups. Icelanders are concerned that their fisheries have become private—a point of some dispute in a country that believes fisheries are a public resource. In response, Parliament issued a declaration that fish are the property of the nation at the same time modifying rules to increase reliance on the rights created by the ITQ system (OECD, 2000a).

Consolidation of quota shares under the existing program has hurt small communities (with populations of less than 500) more than larger communities, as the tendency is for quota shares to become more concentrated in

larger communities (NRC, 1999). The redistribution of interests is not thought to have created any regional redistribution, which may be the reason that most transfers have been permitted (OECD, 2000a). Small communities also fear the move to include small vessels in the program, which they believe will lead to further concentration of quota shares in large vessels that are typically based in larger communities (FNI, 2001). Small communities depend more on small vessels than large vessels. In a few villages, up to 80 percent of harvests are by the small vessel fleet that is currently exempt from the ITQ program. In over 20 villages, more than 30 percent of harvests are by this small vessel fleet. Losses to communities from quota shares being sold are said to extend beyond the decline in the harvesting sector, as many businesses can be affected (including those unrelated to fishing). Some communities have responded, making purchases in the quota share market to support local fishermen. Small processors also fear that the inclusion of small vessel owners in the program will further harm their businesses.

The positions of small communities, small vessel owners, and small processors are also affected by the price of quota shares. In recent years, the quota share prices have increased sharply. In the current market, quota shares lease for more than one-half of the ex vessel price of fish (NRC, 1999). Quota share sales are at approximately three times the ex vessel price of fish—so the entire revenues of three years harvests would be required to pay the cost of purchasing a share (FNI, 2001). These high prices are thought to exacerbate the problems of small communities, as small vessel owners are attracted to the immediate return from the sale of quota shares. The current quota prices also affect crews and processors. Fishermen are said to have been forced to reduce crew shares to cover the cost of quota shares. The cost of fish to processors is said to have risen to the point where some of the small processors are complaining that they are unable to recruit employees and are unable to keep up with plant maintenance (FNI, 2001). The consequences of the inclusion of small vessels in the program are uncertain. Their inclusion will help regulators control harvests, but the change could be detrimental to the small vessel fleet, small processors, and small communities.

Individual Quotas and Cooperative Management in the Netherlands

In recent years, fisheries management in the Netherlands has focused on the reduction of fleet capacity. Initial efforts to address this problem included a license program that limited entry to replacement vessels of smaller engine capacity than the vessels that they replaced. Later measures have included the development of effort limitations (such as days at sea limits), individual quotas, co-management, and vessel buyouts (MANM, 1993). These measures have been relatively successful, as vessels in the fisheries declined by approximately 15 to 20 percent in the first half of the 1990s (NRC, 1999).

The ability of the Netherlands to implement its own fisheries policy is somewhat constrained by its membership in the European Union (EU). The EU under its Common Fisheries Policy grants member countries a share of the overall TAC in the EU fisheries. Within each member country, allocation of interests among fishermen remains the province of the country.

The Dutch have used individual quotas (IQ) in management since 1976 when they were implemented in the plaice and sole fisheries. Managers have since expanded their use to several other fisheries. IQ first became transferrable among licensed fishermen in 1985, with a provision for temporary ownership by shipyards and banks to enable fishermen to use them as collateral for loans. Transfer rules allow shares to be leased or sold in whole but are not divisible (NRC, 1999). Shares can also be set aside for a period of up to two years, to allow fishermen to take their vessels out of service. Days at sea limits continued to be maintained to limit effort levels in the fisheries (MANM, 1993).

The roundfish fishery (cod and whiting), mackerel, and herring fisheries have been (or are being) managed by using a system of "documents". "Documents" allow the holder to harvest of a specific amount of a species

each month. This system limits the catch and fishing effort by controlling the issue of documents (MANM, 1993).

In 1993, as part of an effort to improve cooperation and to shift some of the management of fisheries to industry, the government developed a program in which fishermen could join together into groups to manage and fish their IQ shares. Under the program each group is responsible for development and enforcement of rules under which members fish their shares (MANM, 1993). For the program to be implemented a threshold of 75 percent of vessel owners joining groups was required. The program created incentives for group membership, including greater flexibility for transfers among group members, more days at sea for group members, and a threat of more license buyouts if the system did not succeed (MANM, 1993). Under the program, all share transfers by fishermen that are not members are required to be completed by the end of February. Transfers between groups are required to be completed by the end of November and transfers between group members are permitted at any time. The value of quotas held by fishermen that are not group members are reduced further by an additional provision that prohibits fishing of unused quotas in later years (NRC, 1999). The groups have also been used by fishermen to transfer portions of their shares, an option that is not available to fishermen that are not group members. Fishermen seem satisfied with the plan and prefer the flexibility of comanagement over a system of government oversight. Many believe that co-management has put to rest the race to fish (OECD, 1997). Fishermen also have indicated that the co-management program has helped to level income disparities among fishermen. Whether the satisfaction is with the co-management program or conditions in the fishery is questionable since TACs have been relatively high and capacity is down since the program was implemented (OECD, 1997).

Under this co-management (cooperative) type program, the group is responsible for managing member IQs and allocating member days at sea limits, to ensure that IQ limits are not exceeded. IQs remain individual but the group assumes the responsibility for their management (MANM, 1993). To enable better tracking of harvests, group members are required to sell harvests at auctions (OECD, 1997). Groups are also required to impose heavy fines on fishermen that violate their quotas (MANM, 1993). Although groups at times have been recalcitrant in sanctioning members, actions of government overseers have improved reliance on the system (OECD, 1997).

Individual Fishing Quotas in the Alaska Halibut and Sablefish Fisheries

The Alaska halibut and sablefish fisheries are regulated by similar Individual Fishing Quota (IFQ) programs. Although the fisheries differ, both historically and in the method of prosecution, they are similar in many respects. Both species are targeted with fixed gear, primarily longlines and command a relatively high ex-vessel price. Prior to implementation of the IFQ programs, the fisheries were open access regulated by TAC and season length. The number of participants in the fisheries grew rapidly in the second half of the 20th century, forcing managers to shorten seasons causing a race to fish. The short seasons led to both fisheries becoming part time fisheries. Many participants in the halibut fishery fished only halibut commercially, relying on other jobs as their primary source of income. Other participants in the fishery split their time between the halibut fishery and other fisheries, including the sablefish fishery. The sablefish fishery has a similar history, although it developed later than the halibut fishery. Sablefish also are fished farther from shore than halibut limiting competition somewhat in that fishery.

In the 1980s, both fisheries were experiencing the consequences of the race to fish. Fishermen would fish in poor weather to avoid being left out of the short seasons (for halibut - some were only one day long). Managers had difficulty regulating harvest quantities, as harvest levels could not be accurately gauged for very short openings. Both fisheries were overcapitalized since the only way fishermen could maintain or increase their share of the TAC was by harvesting fish faster. Excessive gear set to increase catch was abandoned on the

closing of the fishery leading to gear loss and deadloss. Quality of fish also suffered both because fresh fish was available for a short time each year and because the race to fish limited the time available to fishermen to carefully handle their catch. The IFQ program was developed, in part, to address these problems.

The initial allocation of quota in the halibut and sablefish IFQ programs was intended to preserve the size and character of the fleets and reward active participants. To accomplish this goal the initial allocation was based on historical participation in the fisheries. To protect investment, only vessel owners (or fishermen that leased vessels) who demonstrated eligibility by participation in the fisheries during 1988, 1989, or 1990 were issued quota shares (QS) in the fisheries. The initial allocation of QS was based on the amount of harvests made by a fisherman during a series of years—a fisherman's best five years from 1984 to 1990 for halibut and a fisherman's best five years from 1985 to 1990 for sablefish. The broad, inclusive distribution of QS from this allocation scheme was intended to limit individual windfalls from the initial allocation and also to prevent hardship to any fisherman that might have been unable to fish for a given period of time because of uncontrollable circumstances.

NMFS developed a separate division, the Restricted Access Management (RAM) division, to implement the initial allocation and operation of the fishery under the IFQ programs. As the name suggests, this division has developed a role in the management of several different federal fisheries in the north Pacific. Management of the halibut and sablefish IFQ programs continues to be the primary duty of the RAM division.

Quota shares (QS) entitle a fisherman to a fixed proportion of the annual TAC in a fishery. A fisherman's annual harvest allotment (referred to as IFQs) is equal to the annual TAC multiplied by the fisherman's QS, divided by the total outstanding QS in the fishery. Both fisheries are divided into several management areas, each with its own QS allotments, corresponding IFQs, and annual TAC. Under the IFQ program, seasons in both fisheries begin on March 15th and end on November 15th. Fishermen are permitted to harvest their IFQs at any time during that period. Owner operator provisions require that the owner of the IFQs be on board the vessel when most classes of IFQs are harvested.⁵

QS (and the corresponding IFQs) are further categorized, based on the size of the vessel on which harvests were made that created the right to the initial allocation of QS. The halibut fishery has four vessel size categories and the sablefish fishery has three vessel size categories. IFQs are permitted to be fished only on vessels of the same or smaller size category. Categorizing QS and IFQ by vessel size is intended to preserve the character of the fleet (especially small vessel participation) by maintaining the distribution of interests across the different vessel size groups.

QS are transferable subject to a variety of limits adopted to manage the fishery and the distribution of interests in the fishery. IFQs, on the other hand, are not transferable, except for IFQs for harvests by freezer vessels. To maintain the owner operator character of the fleet the QS and IFQs can be owned only by IFQ crewmembers (defined as crew that have fished in excess of 150 days in a U.S. commercial fishery) and entities that received an initial allocation.⁶ To prevent over-consolidation, ownership and use caps on QS and IFQs apply to both fisheries. In the halibut fishery, ownership of QS is limited to 1.5 percent of the total harvests from the Bering Sea and Aleutian Islands, 0.5 percent of the total harvests from the Gulf of Alaska and

⁵ An exception permits those receiving initial allocation to fish IFQs with hired skippers. In addition, freezer vessel shares are not subject to owner on board requirements, as those vessels are typically owned by larger interests and operated by hired skippers. Corporations or partnerships that own IFQs are required to own at least 20 percent of the vessel on which their IFQs are harvested.

⁶ In Southeast Alaska only IFQ crewmembers are eligible to receive transfers of QS and IFQs.

Southeast Alaska, and a special restriction of 1.0 percent of the total harvests in Southeast Alaska alone. In the sablefish fishery, ownership and use are limited to 1.0 percent of the harvests from the entire fishery and 1.0 percent of the harvests from Southeast Alaska alone. Similar restrictions on the consolidation of use of IFQs on a single vessel provide that no single vessel may harvest more than 1.0 percent of the total halibut TAC or no more than 1.0 percent of the Southeast halibut TAC in any year. Likewise, no single vessel may be used to harvest more than 1.0 percent of the combined TAC from the Bering Sea, Aleutian Islands, and Gulf of Alaska or more than 1.0 percent of the TAC in Southeast Alaska. Southeast Alaska is thought to require additional restriction because of the number of communities in that region that are dependent on the halibut and sablefish fisheries.

The program also contains restrictions on the ownership and division of small quantities of QS (which made up less than 20,000 pounds of IFQs under the 1994 TAC), known as 'blocks'. Fishermen can own only two blocks or only one block and any amount of unblocked QS. Blocks cannot be divided into more than one block or aggregated with other blocks (except that blocks that collectively amount to less than 5,000 pounds of sablefish or 3,000 pounds of halibut may be aggregated into a single block). The development of rules concerning blocks were intended to ensure that the fisheries retain their small fleet characteristics and that interests in the fisheries do not become consolidated in large vessels.

Provisions intended to prevent the consolidation of QS and the interests of small vessels in fisheries have been largely successful. **Tables 1** and **2** show the number of QS shareholder by size of holding in both fisheries from 1995 (at the initial allocation) through 2000. Although consolidation of QS has occurred in both fisheries, QS is still well distributed across all of the different holding sizes. Relatively small QS holdings (less than 10,000 pounds) are more prevalent than larger QS holdings in both fisheries.

The number of vessels active in the fisheries is still quite large but has remained less than the number of QS holders for at least two reasons (**Tables 3** and **4**). First, a share of fishermen have not fished their IFQs in any year. This is more common among holders of small amounts of QS. Second, fishermen also team up on vessels to fish their shares. Fishermen that received initial issuances may hire skippers to fish their IFQs or combine their IFQs with other QS holders' and fish them on a single vessels. Owner on board provisions require that fishermen that have entered the fisheries by purchasing QS be on board any vessel fishing their IFQs.

Table 1: Number of persons holding halibut quota shares by size of holding

Number of QS	Initial (1995)	End of 1996	End of 1997	End of 1998	End of 1999
3,000 or less	2,522	2,244	1,936	1,832	1,672
3,001-10,000	1,158	925	878	865	853
10,001-25,000	648	629	613	613	586
More than 25,000	500	523	537	536	538
Total (unique persons)	4,816	4,321	3,964	3,846	3,649

Table 2: Number of persons holding sablefish quota shares by size of holding

Number of QS	Initial (1995)	End of 1996	End of 1997	End of 1998	End of 1999
5,000 or less	541	497	446	417	403
5,001-10,000	109	102	113	115	114
10,001-25,000	146	145	144	141	140
More than 25,000	254	252	244	246	240
Total (unique persons)	1,052	996	947	919	897

 Table 3: Number of Active Vessels by Halibut Management Area

Management Area	1992	1993	1994	1995	1996	1997	1998	1999
2C	1,775	1,562	1,461	1,105	1,029	993	836	840
3A	1,924	1,529	1,712	1,145	1,104	1,076	899	892
3B	478	401	320	332	350	357	325	323
4A	190	165	176	140	147	142	120	121
4B	82	65	74	57	64	69	47	51
4C	62	58	64	35	41	46	30	36
4D	26	19	39	27	33	33	22	29
Total (unique vessels)	3,452	3,393	3,450	2,057	1,962	1,925	1,601	1,613

Table 4: Number of Active Vessels by Halibut Management Area

Management Area	1992	1993	1994	1995	1996	1997	1998	1999
Southeast	507	391	488	378	378	326	296	283
West Yakutat	266	196	249	228	218	218	176	162
Central Gulf	588	462	562	326	294	273	241	226
Western Gulf	103	29	19	86	81	79	66	63
Aleutian Islands	27	33	33	53	50	47	26	27
Bering Sea	72	40	31	55	49	41	28	20
Total (unique vessels)	1,123	915	1,139	517	503	504	449	433

Beginning in the 2001 season, a cost-recovery program was implemented to fund most program administration. Fees of up to 3 percent of ex-vessel value of IFQ landings may be charged to fishermen. A portion of the collections under this program are used to fund a loan program for fishermen that wish to enter the IFQ fisheries and for small vessel owners that wish to increase their interests in the fisheries.

Although many fishermen are satisfied with the IFQ program, a few identifiable groups are not satisfied with the program. Some fishermen felt that their initial allocations were too small. A survey of first year QS holders in the sablefish fishery found that 20 percent believed that their QS was too small to be fished economically (Knapp and Hull, 1996). Fishermen active in the fishery only between 1991 and 1994 did not receive an initial allocation and believed that the program unfairly excluded them. More than 25 percent of the sablefish and more than 17 percent of the halibut harvested in these years were caught by fishermen that received no initial allocation. Crewmembers were left out of the initial allocation and believe their participation in the fisheries were hurt by the program. Verifying crewmember interests was not possible and crewmembers were viewed as having less of an investment in the fishery than vessel owners who had purchased vessels to support their activity. Processors also were excluded from the initial allocation. Processors believe that their investment in the fisheries are comparable to those of fishermen, since they purchase plant equipment to support their operations.

Individual Quotas in the Newfoundland Snow Crab Fishery

The Newfoundland snow crab fishery originated in the late 1960s. The fishery developed as a directed fishery in the 1970s and steadily expanded in both size and area with declines in the groundfish fisheries. Landings in the fishery were less than 5,000 tons for most of the 1970s. At the end of the 1970s and for the first half of the 1980s landings averaged approximately 12,000 tons. **Table 5** shows that landings declined slightly for the remainder of the 1980s, then rose substantially through the 1990s exceeding 52,000 tons (or 115 million pounds) in 1998.

Table 5: Newfoundland Snow Crab Fishery Quota, Landings, Landed Value, and Average Price for the Years (1985-1998)

Year	Quota	Landings (thousand metric tons)	Landed Value (millions \$CA)	Average price (\$CA/Lb)
1985		8	6.9	0.39
1986	9.2	9	10.3	0.52
1987	8.4	6.7	12.6	0.86
1988	8.6	9.6	21.8	1.03
1989	10.1	8.3	10.3	0.56
1990	10.5	11	13.1	0.54
1991	15.8	16.2	19.9	0.56
1992	14.5	16.4	13.0	0.36
1993	18.7	22.9	31.7	0.63
1994	23.8	27.9	87.2	1.42
1995	31.9	32.4	176.2	2.47
1996	37.8	38	96.8	1.16
1997	44.5	45.7	91.7	0.91
1998	49.2	52.7	101.6	0.88

Source: Integrated Management Plan Newfoundland and Labrador Snow Crab 1999-2001 (1999) Fisheries Management Branch, Department of Fisheries and Oceans, Canada.

The increase in landings in the 1990s were a result of two factors. First, good recruitment during this period increased the biomass. Second, the range of fishing expanded substantially as the fishery expanded to accommodate Newfoundland fishermen moving to the crab fishery from the declining groundfish fishery. Although, the fleet consistently exceeded the quota during the late 1980s and 1990s, these overruns resulted primarily from harvests from exploratory fisheries that operated without quotas.

The importance of the crab fishery increased substantially in the early 1990s as Newfoundland groundfish fisheries collapsed. From 1987 to 1991, snow crab harvests comprised 9 percent of the landed value of vessels less than 65 feet. By 1995, crab accounted for 71 percent of this fleet's landed value. Although still very important, crab harvests declined to approximately was 46 percent of this fleet's landed value for the years 1996 to 1998.

The distribution of harvests among the fleets in the snow crab fishery has been greatly impacted by the attempt to alleviate financial stress to fishermen resulting from the declines in the groundfish fisheries. The composition of the fleet demonstrates this. The crab fishery is composed of three fleets (Table 6), each of which is divided into several fleets. Original participants in the fishery, most of whom operate vessels 50 to 65 feet in length, comprise the fulltime fleet. A supplementary fleet (established to supplement incomes affected by groundfish declines) is made up of vessels between 34 and 65 feet. A temporary seasonal fleet for vessels under 35 feet in length without crab licenses was established in 1995 for small vessels adversely affected by the closure of the cod fishery. This fleet carries only yearly permits, with the continued issuance dependent on stock levels in the fishery. A small exploratory fleet also participates in the fishery. The fishery is divided regionally and is structured so that larger vessels are required to fish in areas further from shore. A large majority of vessels are in the temporary seasonal fleet, with the fulltime fishery being the smallest. In addition, a communal snow crab license is issued to the Labrador Inuit Association, who participate in the northern area of the fishery.

Table 6: Number of Newfoundland snow crab fishery license and permit holders 1998 season

Temporary Seasonal	Supplemental	Fulltime	Exploratory	Total
2,499	700	71	70	3,340

Fleet quotas (or allocations of quotas to different sectors of the fleet), limitations on entry, individual quotas, harvest limits, seasons, softshell closures, specific landing weeks and gear limitations are used to regulate the fishery. The first individual quotas were issued as part of a pilot program in 1995. Individual quotas were quickly adopted throughout the fleet with 95 percent of the fishery currently managed under individual quota systems. Support for individual quotas is evident since conversion to quotas requires two-thirds agreement of license holders in the affected fleet. Only one fleet in one region did not elect to operate under individual quotas in the 1999 and 2000 seasons. Individual quota distributions are made from the fleet quota, which is determined annually by Department of Fisheries and Oceans (DFO). Once the individual quota system is adopted, fleet representatives determine the specific individual quota distributions (DFO, 1999). Currently, fleets distribute quota equally among vessels. Neither licenses nor quotas are transferable. Processors have participated in the consultative process but have no direct allocation of an interest in the fishery. Crewmembers do not receive a direct allocation, except for crewmembers that are the heads of enterprises and license holders (Dooley, 2001).

Individual quotas have decreased the need for some management measures, such as staggered openings, landing limits, and trap limits.⁷ These measures, however, have been retained to maintain orderly harvesting and processing of quotas. Because these measures were adopted through a consultation process involving both the harvesting and processing sectors, changes in these measures would require approval of both sectors.

One of the more controversial management measures is a "buddy up" program that is applicable only to the temporary seasonal fleet. Under the program, two license holders can work together on a single vessel to harvest their individual quotas. Participants must notify DFO of their intent to participate in the program. The program requires both license holders to participate in harvesting and prohibits vessel leasing. The program is also applicable only in areas where it is approved by a majority of the temporary seasonal fleet.

All landings are monitored by DFO certified monitors at the expense of the fisherman or fleet. In addition, a fee of one-third cent per pound of quota is paid by each fisherman to pay for 10 percent observer coverage. In addition, each fleet is responsible for administration of its own individual quota program and week and trip landing limits. Guidelines adopted by each fleet are subject to the approval of DFO and should contain appropriate sanctions for fishermen that exceed their quotas.

The management of the fishery has been adapted to meet several objectives, including maintaining or increasing quotas for all vessels. This objective is being addressed in part by developing the fishery further from shore. Generally, fleet members are not forced to move out but vessels have been induced to move out by the potential to obtain greater quota for participating in more distant waters.

High grading is also a concern in the fishery since two prices exist in the market. A higher price is usually received for crab with a carapace greater than 4 inches. High grading has been discouraged by a "20 percent

⁷ No landing limits apply to the temporary seasonal fleet, since the small vessels in this fleet have limited capacity.

tolerance" pricing program adopted in the fishery. Under this program, the first 20 percent of undersized crab is purchased at the higher price paid for larger crab, reducing the incentive for discarding undersized crab.

Pacific Whiting Cooperatives

In 1996, a limited entry program divided the Pacific Coast whiting fishery among the onshore, offshore, and mothership sectors. The program permitted catcher processors to purchase and combine licenses from smaller catcher vessels to enter the fishery. By 1997, four companies owned licenses for the offshore sector and were using ten catcher processors in the fishery. Regulation fixed the offshore sector's share of the fishery, creating a small, identifiable class of vessels that competed for a fixed share of the fishery. In mid-1997, the four companies participating in the offshore fishery, formed the Pacific Whiting Conservation Cooperative, dividing the offshore fishery among the companies and ending the race to fish in that sector. Under the cooperative agreement, the companies negotiated a division of the annual harvests based on each company's history in the fishery and harvest capacity. The cooperative agreement provides for harvest monitoring and penalty provisions for overharvesting shares to ensure that the agreement is adhered to.

The cooperative brought substantial changes to the offshore sector of the fishery. With the reduced pressure to harvest fish quickly, three of the ten catcher processors were no longer used in the fishery in 1998. Shares were leased among the cooperative members to increase efficiency of the fleet. Management of the harvests from the fishery are also more precise under the cooperative. Under the previous management, managers would close the fishery as the fleet approached the TAC, using a conservative cut off to ensure that the TAC was not exceeded. Private harvest monitoring on a vessel basis under the cooperative has enabled the members to limit their harvests to their allocation. Accuracy is improved by the slower pace in the fishery. The division of the fishery among members and coordination of monitoring has allowed participants to focus efforts on harvesting the quota, not simply harvesting fish as quickly as possible. The cooperative has also coordinated the harvest of the last part of the each member's quota on a single vessel to limit the chances of overharvesting the quota.

Bycatch rates have declined as much as 50 percent under the cooperative. Since a vessel's allocation is not determined by the rate at which it harvests fish, vessels can afford the time to move if bycatch rates in an area are high. Real-time monitoring among cooperative members has provided more current bycatch information enabling vessels to avoid areas with high bycatch rates. The success of the cooperative in reducing bycatch is shown by the decline of bycatch of yellowtail rockfish from 2.47 kg per metric ton of whiting to 0.96 kg per metric ton. Vessels in the mothership sector increased bycatch of yellowtail rockfish from 3.43 kg per metric ton to 6.51 kg per metric ton during the same period.

Recovery rates have risen by 40 percent under the cooperative. Vessels have time to target larger fish, which have higher product yields than smaller fish. Changes in production output, mostly in response to market changes, have also increased recovery rates. With the weak Asian economy demand for surimi was low in the late 1990s. Catcher processors in the cooperative were able to switch production from surimi to fillets and block products increasing profitability. The cooperative helped make this possible by allowing producers to respond to markets without the time pressures of the race to fish. A secondary advantage of the change is that the distribution of products to US consumers increased since US consumers tend to prefer fillets and block products to surimi.

⁸The inshore fleet has not entered a cooperative agreement, but has engaged in some co-management to establish rules to reduce bycatch of rockfish (Salens, 2001).

The only reported downside of the development of cooperatives is that some of the vessels that became surplus in the whiting fishery have moved contributing to overcapacity in other fisheries.

BSAI Pollock Cooperatives

Passage of the American Fisheries Act (AFA) generated an industry structure suitable to the formation of cooperatives. The AFA divided the at-sea portion of the BSAI pollock allocation into two parts (an allocation to catcher/processors and the catcher vessels that deliver to them and the catcher vessels in the mothership sector). The AFA also limited entry into the fishery by identifying a eligible pool of vessels and processors based on recent historic participation. These were the two primary factors that allowed cooperatives to form.

Cooperatives were formed in all three sectors of the BSAI pollock fishery. All eligible catcher/processors and the catcher vessels that delivered to them were able to form a cooperative in 1999. Members of the mothership sector formed a single cooperative in 2000. Seven cooperatives were formed in the inshore sector in 2000. Activities of all the inshore cooperatives are linked/monitored through an inter-cooperative agreement that every inshore cooperative has agreed to operate under. Inshore cooperatives were formed by the catcher vessels that delivered a majority of their landings to an eligible processor during the qualifying years.

The structure of the current BSAI pollock fishery divided the TAC so that 50% is allocated to the inshore sector, 40% to the catcher/processor sector (including the catcher vessels that deliver to catcher/processors), and 10% to the mothership sector, after 10% of TAC is deducted for Community Development Quotas and an additional deduction (about 3-5%) is made for pollock bycatch in other fisheries. Each cooperative is then allocated a percentage of that sector's allocation, by NMFS, based on the catch history of the vessels that join. The cooperatives then determine how much pollock each vessel in the cooperative will be allowed to harvest. Cooperatives then monitor the catch of individuals to ensure they have not exceeded their allocation. Cooperative agreements are in place that define penalties and fines if a vessel exceeds their allotment. NMFS in turn monitors the harvests of the cooperatives, and imposes penalties if a cooperative exceeds its allocation.

Members of the BSAI pollock fleet then operate under "sideboard" caps in other fisheries. These caps limit the amount of other species they can harvest, to protect the historic participants in those fisheries from being adversely impacted as a result of the pollock fleet changing harvest patterns.

Most members of the fishing industry feel that the cooperatives have been very successful (NPFMC, 2002). The race to fish has slowed, excess capacity has been removed from the fishery, utilization rates of the pollock harvested have increased, and spillover into other fisheries has been constrained. The improvements in fishing performance were predicted by the fleets before the AFA was implemented.

Some members of industry, primarily those excluded from the initial allocation or those that would have received relatively small allocations, have expressed the most dissatisfaction with the program. Those concerns are certainly understandable. Others that have expressed concern are members of other fisheries that could potentially be affected by changes in the pollock participation patterns.

Individual Transferable Quota in the South Atlantic Wreckfish Fishery

⁹Some of the vessels that were eligible to join those cooperatives elected to remain in the open access fishery instead. The quota in that fishery is determined by the historical catch of the vessels that elect to join. Fewer vessels joined the open access fishery in 2001 than in 2000. Part of the decrease is due to regulatory changes that define the amount of pollock assigned to the open access pool.

An Individual Transferable Quota (ITQ) program is currently used to manage the South Atlantic wreckfish fishery. The fishery is conducted in an area approximately 120 miles offshore of South Carolina. Wreckfish species biology was and is largely unknown. The fish is long lived but population dynamics are not well understood. The fishery began in 1987. The fishery grew rapidly from its outset. Harvests grew from 29 thousand pounds in 1987 to 4 million pounds in 1990. Participation grew from 2 vessels in 1987 to 80 vessels in 1991. Prior to the ITQ program the fishery was managed by TAC, trip limits, a permit system, a spawning closure, restricted offloading hours, and a bottom longlining limit. The ITQ program was adopted both to protect the species and to avoid a race to fish that was developing in the fishery.

Shares in the fishery were allocated to all permit holders that landed more than 5,000 pounds of wreckfish in either 1989 or 1990. Half of the initial allocation was distributed in proportion to landings for the years 1987 to 1990 and half was distributed in equal shares to all permit holders qualified to receive an initial allocation. The initial allocation to any business entity was capped at 10 percent of the total initial allocation. Annually, each holder of shares is issued a coupon for a share of the TAC, which is based on proportion of the total share holdings. Coupons are valid for use in a single year. Only permit holders are allowed to own shares or the coupons that represent yearly harvest allocations. Permits are limited and apply not only to the wreckfish fishery but also to the snapper and grouper fisheries. Transfers of shares and coupons are otherwise unrestricted.

Under the program the TAC and harvests have remained relatively constant. In every year, harvests are far below the TAC. Underharvesting is thought to be caused by the relatively low price of wreckfish, in comparison to other species that could be targeted by the same vessels. The number of vessels in the fishery has declined substantially since the ITQ program was implemented. By 1996, the fishery was reduced to 25 shareholders, only 8 of whom participated in the fishery. Currently, approximately 2 fishermen are active in the fishery. These 2 fishermen sell their harvests to the same dealer. Vertical integration does not appear to be a problem in the fishery.

Because of the relatively few fishermen participating in the fishery and the quantity of unharvested TAC some experts believe that quota share holders may be "banking" the catch, saving the biomass for future years when prices rise relative to the other fisheries. Given the dearth of information concerning wreckfish populations, the unharvested TAC may also be beneficial from a biological and management perspective. On the other hand, fishermen wishing to enter the fishery are frustrated by the amount of TAC that ITQ holders have left unharvested. These excluded fishermen believe that the ITQ program has unfairly excluded them from participating in an underexploited resource.

REFERENCES

APA, 2001. At-Sea Processors Association, "A Case Study of Fish Harvesting Cooperatives: The Pacific Whiting Conservation Cooperative (PWCC)," downloaded October 17, 2001, http://www.atsea.org/concerns/pwcc.html

Department of Fisheries and Oceans (1999) "Integrated management Plan, Snow Crab, Newfoundland Region, 1999-2001, Department of Fisheries and Oceans, Fisheries Management Branch, St. John's, Newfoundland, Canada.

Dooley, Tom, (August 2001) personal communication, Director of Resource Policy, Department of Fisheries and Aquaculture, Government of Newfoundland and Labrador.

Fishing News International (July 2001) "Don't Wreck New Fresh Fish Industry" Fishing News International, Devon, U.K.

Fishing News International (July 2001) "Iceland - Quota Costs Becoming Huge Burden" Fishing News International, Devon, U.K.

Icelandic Ministry of Fisheries (August 7, 2001) "Responsible Fisheries," Information Centre of the Icelandic Ministry of Fisheries, http://www.fisheries.is/managem/index.htm

Knapp, G. and D. Hull (September 1996) "The First year of the Alaska IF Q Program: A Survey of Sablefish Quota Share Holders," Institute for Social and Economic Research, University of Alaska Anchorage.

Maharaj, Vishwanie, economist, South Atlantic Fishery Management Council, personal communication, August 30, 2001.

Ministry of Agriculture, Nature Management and Fisheries (1993) "Balanced Fisheries," Ministry of Agriculture, Nature Management and Fisheries The Netherlands, www.minlnv.nl/international/policy/fisheries/, August 7, 2001

NMFS 2000a. Restricted Access Management Division. 2000 Report to the Fleet. July 2000.

National Research Council (1999) "Sharing the Fish: Toward a National Policy on Individual Fishing Quotas," National Academy Press, Washington, D.C.

NPFMC, 2002. Report to the U.S. Congress and the Secretary of Commerce. "Impacts of the American Fisheries Act". North Pacific Fishery Management Council. Anchorage, AK. February 2002.

Organization for Economic Cooperation and Development, (2000a) "Modelling the Transition to Responsible Fisheries: Group I Case Studies", Transition to Responsible Fisheries, OECD, Paris, France.

Organization for Economic Cooperation and Development, (2000b) "Transition to Responsible Fisheries: Post Harvesting Practices and Responsible Fisheries: Case Studies", Transition to Responsible Fisheries, OECD, Paris, France.

Organization for Economic Development and Co-operation (1997) "Towards Sustainable Fisheries: Economic Aspects of the Management of Living Marine Resources," OECD.

Pautzke, C.G. and C.W. Oliver 1997. North Pacific Fishery Management Council. Development of the Individual Fishing Quota Programmeme for Sablefish and Halibut Longline Fisheries off Alaska.

Runolfsson, Birgir and Ragnar Arnason (February 1996) "Evolution and Performance of the Icelandic ITQ System," Icelandic Economic Papers.

Salens, Mark (September 2001) Groundfish Management, Oregon Department of Fish and Wildlife, personal communication.

Sullivan, Joseph M (2000) "Harvesting Cooperatives and U.S. Antitrust Law Recent Developments and Implications," International Institute of Fisheries Economics and Trade, Conference Paper, 2000 Microbehavior and Macroresults.

Van Balsfoort, Gerard (2001) personal communication, Department Director of Fisheries, The Netherlands.

Appendix 2-8 BSAI Crab Rationalization: Implications from the AFA's Effects on Efficiency and Capacity Utilization in the Pollock Fishery

Prepared for the North Pacific Fisheries Management Council

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Abstract

The American Fisheries Act (AFA) of 1998 significantly altered the Bering Sea and Aleutian Islands (BSAI) pollock fishery by allowing the formation of harvesting and processing cooperatives and defining exclusive fishing rights. Currently, a rationalization scheme is being considered for the BSAI crab fisheries that may include components similar to those within the AFA. Thus, where applicable, impacts of the AFA may be used as an indicator of the potential effects of certain proposed crab rationalization tools. This paper discusses the findings of a recent study that looked at the effects of the AFA on catcher-processors' technical harvesting efficiency and capacity utilization.

Therefore, it may be useful to begin this discussion with a description of specific types of production efficiency. This clarification will allow for a bit more specificity and detail in assessing effects of the American Fisheries Act (AFA) and rationalization in the crab fisheries. A common way to decompose overall efficiency is into technical and allocative components (Coelli, Rao, and Battese, 1998). With this distinction made, one can then further specify whether the focus is input-or output-oriented, and whether the focus on harvesting or processing.

In an input orientation, the degree of *technical* efficiency relates to the quantity of inputs used to obtain a given bundle of output(s), where lower levels of input use imply increasing technical efficiency. In an output orientation, the degree of technical efficiency reflects the amount of output one can obtain from a given bundle of inputs. Because the input- and output-oriented measures of technical efficiency essentially capture the same information, the distinction will be dropped for the balance of this discussion. Both measures essentially indicate one's skill in combining inputs to create outputs.

In an input orientation, *allocative* efficiency pertains to the degree to which one chooses the optimal proportion of inputs (to achieve a given level of output), given their relative costs and marginal products. In an output orientation, allocative efficiency reflects the degree to which one chooses the optimal mix of outputs (with a specific input bundle), given the respective market prices and marginal rates of transformation. Loosely speaking, measures of input (output) allocative efficiency can be thought of as the extent to which one minimizes (maximizes) the cost of (revenue from) a given level of outputs (inputs). Note that one can be input-allocatively efficient and output-allocatively inefficient, or vice-versa. Similarly, one can be allocatively efficient and technically inefficient. The point here is that each measure captures a different aspect of production, and each can be affected in different ways from changing institutional or regulatory environments.

It may also be worthwhile to briefly clarify the concept of capacity in fisheries. Many people will equate capacity with capital, or excess capacity with overcapitalization, but as discussed in Kirkley and Squires (1999), the notions coincide only under fairly stringent restrictions on production technologies. Simply put, excess capacity may arise because of excessive use of *all* factors of production (relative to some target level

¹ Input and output distance functions (Shephard, 1970) are the theoretical constructs typically used to measure technical efficiency in input and output orientations, respectively. Under constant returns to scale, the value of an input distance function is the reciprocal of an output distance function.

of output), while overcapitalization merely refers to the presence of excess capital in a fishery – the former being the more relevant concern. Thus, measures of *capacity utilization* indicate the extent to which a vessel is using variable inputs in conjunction with the fixed capital stock to create output (and not just, for example, the size of the capital stock relative to output). In a harvesting context, capacity utilization can be thought of as how one is utilizing the capital base used in fishing practices, while in processing it reflects one's utilization of processing equipment and facilities.

A recent paper by Felthoven (2001) looks at the effects of the American Fisheries Act (AFA) on the BSAI catcher-processor fleet. Although the empirical analysis focuses primarily on the technical efficiency and capacity utilization in harvesting, the paper does discuss effects on allocative efficiency and some aspects of processing. Many of the findings do not appear to be unique results arising from the specific cooperative structure, but instead due to the benefits afforded from eliminating the race for fish and allowing the transfer of quota. Thus, the results of the study presented below represent changes in efficiency and capacity utilization that may be likely under various crab rationalization approaches.

One effect of eliminating the race for fish in the pollock fishery was a significant increase in the harvesting capacity utilization estimates for AFA-eligible vessels.² The number of days spent fishing also increased markedly over past three years, as did the average annual towing time and crew hours. Anecdotal evidence from the pollock fishery also suggests that the slower daily pace allowed vessels to harvest in a more cost-effective manner, thus improving input allocative efficiency. In contrast, estimates of technical harvesting efficiency did not significantly increase after rationalization. This result may come as a surprise, as one might think that with a slower pace and less fierce competitions, one could fish under more desirable conditions and increase the catch per unit effort. The probable causes for this result can likely be attributed to two main factors.

First, the pre-AFA race for fish served as an incentive for throughput and catch maximization, which bolster measures of technical harvesting efficiency. However, in absence of a race for fish, less emphasis is placed on the sheer quantity of fish caught per trip, with more attention being given to the quality and characteristics of the fish being caught. Processing operations now tend to dictate the rate at which fish are caught, and vessels have increased output allocative efficiency through their heightened ability to adapt production to market signals. Second, the potential for increases in technical harvesting efficiency afforded by improved timing and searching for the most productive fishing grounds may have been stifled somewhat by Steller sea lion restrictions. Thus, given the stricter regulatory environment and the apparent harvesting/processing tradeoffs for catcher-processors, the net effect on technical harvesting efficiency (i.e., the lack of an increase) is not too surprising.

The extent to which technical harvesting efficiency may increase under crab rationalization is less likely to depend on sea lion closures than the pollock fishery, but should still be affected by the processing strategies and capacity of inshore processors, and by the potential for gains in allocative efficiency (arising from the heightened ability to target larger, more valuable crabs). Furthermore, capacity utilization gains appear to be quite likely given the relatively short seasons in many of the current crab fisheries.

On the processing side, the AFA led to large gains in technical processing efficiency through increased product recovery rates (PRRs) for pollock. They are reported to have increased by 26% during 1999 over the 1998

² The increases in capacity utilization were also due to increases in each vessel's catch share (because of the buyback program).

baseline, and by 35% in 2000 relative to 1998 (PCC and HSCC, 2001).³ And, given the strong production link in harvesting and processing aboard catcher-processors, the estimated increases in capacity utilization reported for harvesting operations were likely achieved in processing as well⁴. While it is unlikely that the potential PRR increases in crab processing will match those for pollock, other efficiency and capacity utilization gains may be possible. In particular, given the existing capacity of crab processors, the likelihood of a slower pace under rationalization, and the heterogeneity of processing equipment, it may be possible for processors to achieve both technical and allocative gains by retiring older equipment and utilizing newer, more cost-effective capital.

Another interesting factor to note about the pollock fishery is that there were significant differences in the historic technical harvesting efficiency among vessels. This finding is likely due to the heterogeneity of the fleet in terms of vessel size and age. When such differences exist, it implies that potential technical efficiency gains could be realized by shifting harvesting effort from less efficient vessel to more efficient vessels. Given that the fleet of crab vessels is also quite heterogeneous, similar opportunities may exist there as well. Quota transfers would be facilitated within a cooperative or ITQ system. Within the pollock fishery, transfers have occurred between vessels within the same company, between companies, and from catcher boats to catcher-processors.

The empirical results in Felthoven indicate the companies that transferred fishing quota among their vessels typically chose to idle vessels that had the historically lowest levels of technical harvesting efficiency and capacity utilization. This finding is consistent with the claim that the ability of vessels to trade quota will lead to increases in production efficiency. However, the estimates also suggest that the remaining group of active vessels in the fishery was not the most technically efficient group of harvesters overall; some companies active vessels had been historically less technically efficient than other companies' idled vessels, and differences exist among remaining active vessels. This suggests that another potential way to realize increases in technical harvesting efficiency is through inter-company trading of quota, which could be facilitated within either a cooperative or an ITQ system.

The changes in efficiency and capacity utilization discussed above are short-run effects. As discussed in Matulich, Inada and Sever (2001), and Halvorsen, Khalil and Lawarree (1999), the long-term gains depend on issues of market power, the initial allocation of quota, the extent to which the quota can be traded, the rules within any cooperative structure (if adopted), and more. In general, the extent to which a competitive market for quota is limited – either through market power, market failure, regionalization, or other mechanisms – will affect the extent of overall efficiency in a fishery. Furthermore, the management plan that maximizes the degree of efficiency achieved in harvesting and processing may not coincide with that which provides an equitable or popular distribution of benefits to current fishery participants. Regardless of such concerns, one thing is relatively certain, and is supported by the repercussions of the AFA: relative to open-access, rationalization provides the mechanism and incentives for increases in technical and allocative efficiency for

³ This increase is attributable to two factors: pure technical efficiency increases in processing for a given type of product, and a change toward products that have relatively high product recovery rates (which was largely motivated their market prices).

⁴ Increases in harvesting capacity utilization are likely to lead to additional utilization of processing capacity since most fish accounted for in harvesting by pollock catcher-processors will enter the processing chain due to the full retention and utilization requirements for pollock and cod.

⁵ This is not to say that past levels of technical efficiency or the extent to which the vessel had been utilized is the deciding factor in choosing which vessel to operate. However, these factors are correlated with overall profitability and had good predictive power in probit models that modeled post-AFA participation as a function of past technical efficiency and capacity utilization.

both harvesters and processors. It is the question of who will capture these benefits that is more difficult to address.

References

- Coelli, T., D.S.P. Rao, and G.E. Battese. *An Introduction to Efficiency and Productivity Analysis*. Kluwer Academic Publishers, 1998.
- Felthoven, R.G. "Effects of the American Fisheries Act on Capacity, Utilization, and Technical Efficiency in Alaskan Pollock Fisheries." Working Paper, National Marine Fisheries Service, Alaska Fisheries Science Center. October 2001.
- Halvorsen, R., F. Khalil, and J. Lawarree. "Inshore Sector Catcher Vessel Cooperatives in the Bering Sea/Aleutian Islands Pollock Fisheries." Discussion paper prepared for the North Pacific Fishery Management Council. September 1999.
- Kirkley, J., and D. Squires. ACapacity and Capacity Utilization in Fishing Industries. University of California, San Diego Discussion Paper 99-16, 1999.
- Matulich, S.C., M. Sever, and F. Inaba. "Fishery Cooperatives as an Alternative to ITQs: Implications of the American Fisheries Act." *Marine Resource Economics*, vol. 16(1), pp. 1-16, 2001.
- Pollock Conservation Cooperative and High Seas Catchers' Cooperative. "Joint Report of the Pollock Conservation Cooperative and High Seas Catchers' Cooperative, 2000; Presented to the North Pacific Fishery Management Council." January 2001.
- Shephard, R.W. Theory of Cost and Production Functions. Princeton: Princeton University Press, 1970.

Appendix 2-9 Product Markets and Prices

Crab produced in Alaska's fisheries enters a world market. As a result, global production, seasonal supply and demand fluctuations, inventory levels, and exchange rates all play a role in the market for Alaska crab. Product markets and prices can influence the ex-vessel price that processors are willing to pay for harvested crab. This subsection provides data and information on the global production and consumption of crab products. The discussion separates crab by general species groups focusing on the two species groups produced in the BSAI crab fisheries—*Paralithodes* (or king crab) species group and the *Chinonoecetes* (or Tanner crab) species group.⁶

2-9.1 Global Production of King and Tanner Crab

Figures 2-9-1 and 2-9-2 show the historical harvest levels of king and Tanner crab by the major global harvesters. King crab is currently harvested primarily by the U.S. and Russia. In the early 1970s, Japan was also a major harvester of king crab. Since Japanese harvests declined in the mid-1970s, the combined harvests of king crab by countries other than the U.S. and Russia (formerly the U.S.S.R.) has averaged less than 1 percent of the global harvest. From 1972 to 1981, the U.S. harvested the majority of the global king crab harvests. U.S. harvests peaked in 1980 at about 186 million pounds—82 percent of global harvests. Starting in 1981, the U.S. harvest of king crab declined sharply as resource abundance declined. At the same time, king crab harvested by the former U.S.S.R. began to increase. Since 1982, the global harvest of king crab has averaged approximately 100 million pounds per year, with the U.S. harvesting approximately 22 percent and Russia (or the former U.S.S.R.) harvesting approximately 77 percent.

The majority of global Tanner crab harvests are by the U.S. and Canada. Japan and Russia also harvest Tanner crab, although harvest data for Russia (and the former U.S.S.R.) is not available prior to 1978. Since the early 1970s, U.S. harvests of Tanner crab have cycled—sharply increasing and decreasing with changes in effort and resource abundance. From a low of approximately 50 million pounds in 1984, the U.S. harvest of Tanner crab climbed to a peak of approximately 357 million pounds in 1991. The number of U.S. vessels participating in the Tanner crab fisheries increased steadily during this time period, precipitated in part by the decline of the king crab fisheries in the early 1980s. Canadian harvests of snow crab have also cycled, but a relationship with U.S. cycles is not clear. Since 1989, Canadian harvests of Tanner crab have steadily grown, reaching 209 million pounds in 1999. Since 1995 (except in 1998), Canada's share of global Tanner crab harvests has exceeded that of the U.S.

⁶ For purposes of this subsection the king crab group includes all species of king crab and the Tanner crab group includes *C. opilio* and *C. bairdi*.

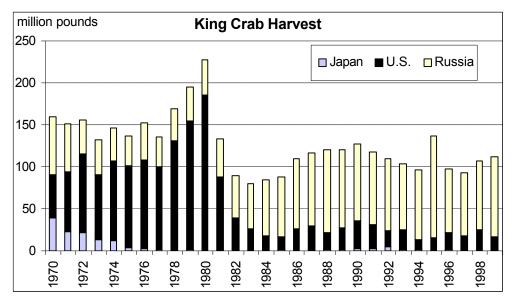


Figure 2-9-1 Harvest of king crab species by major producing country.

Source: U.N. FAO

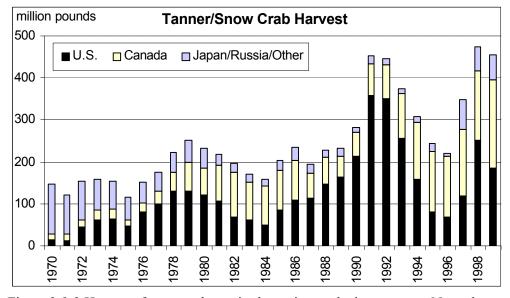


Figure 2-9-2 Harvest of snow crab species by major producing country. Note: data for Russia not available prior to 1997. Source: U.N. FAO

2.9.2 Exports, Imports and Consumption of King and Tanner Crab

Statistics on U.S. exports and imports of king and Tanner crab are available from the NMFS Office of Industry and Trade.⁷

<u>U.S. Exports by Country.</u> U.S. exports of king and Tanner crab are shown in Tables 2-9-1 and 2-9-2. For both king and Tanner crab, the majority of crab exports are exported to Japan. King crab exports peaked in 1993 at 13.4 million pounds, with 92 percent of exports going to Japan. Since 1993, annual exports of King crab have ranged from 6 to 10 million pounds. Since then, the proportion of King crab exports going to Japan has declined (from 92 percent in 1993 to 71 percent in 2000), while the proportion of exports to Canada has risen (from 6 percent in 1993 to over 20 percent in 1998, 1999, and 2000).

U.S. exports of snow crab products peaked in 1992 at 137 million pounds, with 92 percent exported to Japan. Since 1992, U.S. exports of snow crab have dropped sharply, mainly due to the decline in resource abundance. In 2000, the U.S. exported 12.3 million pounds of snow crab which is less than 10% of the 1992 export level. The proportion of snow crab exports going to Japan has also declined, from 92% in 1992 to 72% in 2000. Over this time, the proportion of exports to other countries has increased, especially exports to China. For example, less than 5% of snow crab exports went to China in 1992 while over 20% of exports went to China in 1999.

Table 2-9-1 U.S. Exports of King Crab Products

	U.	S. Exports	of King Cr	ab (millions	of pounds)		%
	Japan	Canada	Thailand	China	Mexico	Other	Total	Japan
1989	0.03	0.05			0.01	0.02	0.11	25%
1990	0.04				0.00	0.08	0.13	35%
1991	8.54				0.00	0.05	8.59	99%
1992	7.89	0.37			0.03	0.14	8.43	94%
1993	12.37	0.76		0.22	0.01	0.05	13.41	92%
1994	7.22	0.61			0.06	0.28	8.17	88%
1995	5.55	0.62	0.00	80.0	0.00	0.18	6.44	86%
1996	8.60	0.87	0.17	0.03	0.00	0.26	9.92	87%
1997	4.48	0.98	0.37	0.17	0.04	0.40	6.44	70%
1998	4.74	1.57	0.47		0.01	0.34	7.13	66%
1999	3.93	1.68	0.13		0.14	0.31	6.18	64%
2000	5.20	1.55	0.08	0.02	0.11	0.35	7.30	71%

Source: NMFS, Office of Industry & Trade

⁷ Data files of the NMFS Office of Industry & Trade define "snow crab" to include both C. bairdi and C. opilio (and a few other species). For consistency, "Tanner" is substituted for "snow" in this analysis.

Table 2-9-2 U.S. Exports of Snow Crab Products

	U.	.S. Export	s of Snow (Crab (millio	n pounds)			%
Year	Japan	China	S. Korea	Canada	Thailand	Other	Total	Japan
1989	0.31		0.10	0.05		0.08	0.54	57%
1990	2.15	0.09	0.94		0.00	0.16	3.34	64%
1991	68.54	1.49	0.36		0.67	0.82	71.88	95%
1992	127.14	6.54	0.78	0.68	0.79	1.21	137.13	93%
1993	92.25	7.26	1.00	0.36	0.55	0.44	101.87	91%
1994	62.43	5.17	0.66	0.26	0.04	0.22	68.78	91%
1995	26.25	0.65	0.03	0.07	0.06	0.28	27.34	96%
1996	19.22	1.57	0.14	0.11	0.17	0.95	22.17	87%
1997	20.28	1.19	0.01	0.40	0.38	0.75	23.00	88%
1998	23.71	2.24		0.45	0.00	0.39	26.79	89%
1999	27.53	7.55		0.18	0.01	0.41	35.68	77%
2000	8.92	2.21	0.05	0.15	0.19	0.80	12.32	72%

Source: NMFS, Office of Industry & Trade

<u>U.S. Imports by Country</u>. U.S. imports of king and snow crab products are shown in Tables 2-9-3 and 2-9-4, respectively. The majority of king crab imports are imported from Russia while the majority of snow crab imports are imported from Canada. While exports of king and snow crab products declined in the late 1990's due to declining resource abundance, imports of both have increased during this time period. Imports of king crab increased from a low of 3.1 million pounds in 1993 to a high of 27.4 million pounds in 1998. Since 1997, over 90% of king crab imports have been imported from Russia. U.S. imports of snow crab have generally increased during the 1990's, except for a one-year decline in 1995. In 2000, the U.S. imported over 68 million pounds of snow crab, with 86% coming from Canada.

Table 2-9-3 U.S. Imports of King Crab

		U.S. Impor	ts of King	Crab (millio	n pounds)			%
	Russia	S. Korea	Canada	Japan	Indonesia	Other	Total	Russia
1989	0.00	0.07	0.00	0.20	0.20	0.53	1.00	
1990	0.00	0.00	0.07	0.03	0.27	0.64	1.01	
1991	0.00	0.15	0.14	0.08	0.25	1.22	1.84	
1992	4.43	0.15	0.29	0.51	0.02	0.17	5.59	79%
1993	2.41	0.00	0.39	0.18	0.06	0.08	3.12	77%
1994	5.68	0.09	0.89	0.04	0.05	0.08	6.83	83%
1995	8.58	0.10	0.49	0.00	0.07	0.23	9.48	91%
1996	12.27	0.90	0.37	0.19	0.08	0.51	14.32	86%
1997	19.89	1.62	0.30	0.03	0.03	0.09	21.97	91%
1998	25.87	0.33	0.21	0.05	0.06	0.86	27.38	94%
1999	24.38	0.88	0.04	0.36	0.05	0.15	25.87	94%
2000	20.59	0.56	0.08	1.04	0.05	0.14	22.46	92%

Source: NMFS, Office of Industry & Trade

<u>U.S. Exports by Product Form.</u> Amounts and average values of U.S. exports of king and snow crab by product forms are shown in Tables 2-9-5 and 2-9-6, respectively. Exports of crab are broken down into three product categories, frozen crab, frozen crabmeat and crabmeat in air tight containers (ATC). For both king and snow crab, the vast majority of exports are in the frozen crab product form. Relatively small amounts of king and snow crab are exported as crabmeat (either frozen or in ATC). Typically, frozen crab sections have a higher average exported value than crabmeat. Also, exported king crab typically has a higher average value than exported frozen snow crab. For example, since 1991, the average value of exported frozen king crab ranged from \$3.34 per pound (in 1998) to \$7.31 per pound in 1992 while the average value of exported frozen snow crab ranged from \$2.03 per pound (in 1998) to \$4.58 per pound (in 1995). The difference in average exported value between frozen king crab and frozen snow crab reflects (1) differences in end market uses, and (2) differences in supply and demand. For example, king crab is viewed as comparable to lobster and tends to be sold into the higher end of the market while snow crab tends to be sold into the lower end of the market (e.g., restaurants offering buffets, etc.).

Table 2-9-4 U.S. Imports of Snow Crab Products

	U	.S. Import	s of Snow	Crab (millio	n pounds)			%
Year	Canada	Russia	S. Korea	Greenland	Japan	Other	Total	Canada
1989	0.18		0.11		0.48	0.07	0.84	22%
1990	1.73		0.43		0.41	0.12	2.69	64%
1991	3.51		1.16		0.46	0.19	5.32	66%
1992	4.20		0.72	0.00	0.38	0.19	5.49	77%
1993	7.69		0.67		0.45	0.09	8.90	86%
1994	7.95		1.63		0.55	0.16	10.29	77%
1995	4.68		1.17	0.76	1.14	0.20	7.96	59%
1996	9.13	0.08	1.07	0.09	0.86	0.02	11.26	81%
1997	14.68	1.82	1.63	0.70	0.56	0.06	19.44	76%
1998	24.73	3.69	1.51	0.64	0.72	0.10	31.38	79%
1999	52.34	2.99	1.12	2.73	0.72	0.80	60.70	86%
2000	58.70	2.92	0.63	3.70	0.98	1.67	68.59	86%

Source: NMFS, Office of Industry & Trade

Table 2-9-5 U.S. Exports of King Crab by Product Form

						•			
	King C	Crab	King Cra	bmeat	King Cra	abmeat			
	Froz	en	Froz	en	in A	ГС*	Total		
Year	mil lbs	\$/lb	mil lbs	\$/lb	mil lbs	\$/lb	mil lbs	\$mil	
1989			0.07	5.60	0.03	2.35	0.1	0.5	
1990			0.05	8.02	0.07	2.83	0.1	0.6	
1991	8.5	6.31	0.04	6.19	0.05	4.76	8.6	54.1	
1992	8.2	7.31	0.05	4.35	0.22	3.57	8.4	60.7	
1993	13.1	6.56	0.08	6.41	0.19	3.69	13.4	87.4	
1994	8.0	5.99	0.05	2.69	0.13	4.06	8.2	48.5	
1995	6.3	5.54	0.06	2.61	0.09	2.87	6.4	35.3	
1996	9.8	5.75	0.04	2.55	0.05	2.65	9.9	56.8	
1997	6.2	4.58	0.04	4.62	0.24	2.14	6.4	28.9	
1998	6.8	3.34	0.09	3.21	0.21	2.59	7.1	23.6	
1999	6.0	4.24	0.06	1.89	0.10	2.04	6.2	25.9	
2000	6.7	6.75	0.32	2.39	0.26	2.44	7.3	46.8	

*ATC = air tight container

Source: NMFS, Office of Industry & Trade

Table 2-9-6 U.S. Exports of Snow Crab by Product Form

	Snow (Crab	Opilio (r	neat)	Opilio (Opilio (meat)		meat)	Other (r	meat)		
	Froz	en	Froz	en	in A7	ΓC*	Froz	en	in AT	C*	Total	
Year	mil lbs	\$/lb	mil lbs	\$/lb	mil lbs	\$/lb	mil lbs	\$/lb	mil lbs	\$/lb	mil lbs	\$mil
1989			0.1	1.80			0.5	1.77	0.0	7.61	0.5	1.0
1990			1.8	2.19	0.0	5.50	1.5	2.11	0.0	5.23	3.3	7.3
1991	71.0	2.16	0.2	1.89	0.0	3.37	0.7	0.86	0.0	3.21	71.9	154.5
1992	135.8	2.22	0.1	2.26			1.1	0.67	0.1	1.39	137.1	303.2
1993	100.5	2.67	1.0	2.47			0.1	1.20	0.3	1.63	101.9	271.8
1994	68.6	3.72	0.0	2.02			0.0	5.88	0.1	1.36	68.8	255.9
1995	27.0	4.58	0.1	1.80			0.2	0.95	0.1	1.65	27.3	124.1
1996	21.0	3.33	0.1	1.63			1.0	1.14	0.0	2.03	22.2	71.3
1997	22.4	2.39	0.1	1.80	0.2	2.69	0.2	1.23	0.1	1.21	23.0	54.7
1998	26.4	2.03	0.1	1.52			0.2	1.97	0.0	1.42	26.8	54.2
1999	34.5	2.69	1.0	2.05	0.0	5.14	0.2	1.50	0.0	2.65	35.7	94.9
2000	10.5	3.94	1.1	1.82	0.6	2.04	0.1	1.53	0.0	6.10	12.3	44.9

*ATC = air tight container

Source: NMFS, Office of Industry & Trade

<u>U.S. Trade Balance in Crab Products</u>. The U.S. trade balance (in millions of U.S. dollars) is summarized for king and snow crab products in Table 2-9-7. Note that a small portion of the imports are re-exported to other countries. The U.S. trade balance was positive for both king and snow crab in the early 1990's, i.e., the value of U.S. exports exceeded the value of U.S. imports. Starting 1995 for king crab and 1997 for snow crab, the U.S. has been running a trade deficit for crab products, i.e., the value of imports has exceeded the value of exports. In 2000, the value of U.S. imports reached \$146 million for king crab and \$277 million for snow crab, resulting in trade deficits of \$93 million and \$229 million for king and snow crab, respectively.

Table 2-9-7 U.S. Trade Balance (\$millions) for King and Snow Crab Products

			`	,	_			
		King	Crab			Snov	v Crab	
Year	Import	Export	Re-Export	Balance	Import	Export	Re-Export	Balance
1989	2.3	0.5	0.02	(1.8)	3.2	1.0	0.30	(1.9)
1990	2.6	0.6	0.02	(2.0)	12.9	7.3	0.47	(5.2)
1991	7.5	54.1	0.01	46.7	23.2	154.5	0.02	131.3
1992	24.6	60.7	1.97	38.0	18.8	303.2	0.07	284.5
1993	15.1	87.4	0.02	72.3	28.5	271.8	0.49	243.8
1994	40.5	48.5	0.46	8.5	39.9	255.9	0.23	216.3
1995	49.7	35.3	0.42	(14.0)	35.8	124.1	0.60	88.9
1996	66.4	56.8	0.07	(9.6)	41.7	71.3	0.25	29.9
1997	112.1	28.9	0.69	(82.4)	58.5	54.7	0.18	(3.6)
1998	125.6	23.6	0.22	(101.8)	82.4	54.2	0.60	(27.6)
1999	137.6	25.9	0.43	(111.3)	199.2	94.9	0.08	(104.1)
2000	145.9	46.8	6.06	(93.1)	277.1	44.9	2.72	(229.4)

Source: NMFS, Office of Industry & Trade

<u>Estimated U.S. Consumption and Inventory Changes</u>. Tables 2-9-8 and 2-9-9 summarize estimated yearly U.S. consumption and changes in inventory for king and snow crab, respectively. The yearly consumption plus inventory change (not broken out separately) is estimated as the sum of production and imports minus exports and re-exports. Production (in pounds of product) is estimated by multiplying the yearly harvest by an average product yield (or recovery rate). Typical product yields of 64 percent for king crab and 62 percent for snow

crab were used in the calculations (these product yields were provided by the Alaska Seafood Marketing Institute).

Table 2-9-8 Estimated Consumption (+ Inventory Change) of King Crab (in millions of pounds)

			•			
	Produ	ction			•	Consumption
Year	Catch ¹	Product ²	Import ³	Export ³	Re-Expo ³	+ Chg Inv
1989	26.4	16.9	1.00	0.1	0.01	17.78
1990	33.9	21.7	1.01	0.1	0.00	22.59
1991	28.1	18.0	1.84	8.6	0.00	11.27
1992	19.1	12.2	5.59	8.4	0.33	9.03
1993	24.7	15.8	3.12	13.4	0.00	5.54
1994	12.0	7.7	6.83	8.2	0.06	6.25
1995	14.7	9.4	9.48	6.4	0.06	12.37
1996	21.0	13.4	14.32	9.9	0.01	17.83
1997	18.0	11.5	21.97	6.4	0.16	26.91
1998	24.1	15.4	27.38	7.1	0.04	35.65
1999	16.9	10.8	25.87	6.2	0.10	30.43

Sources: (1) U.N. FAO; (2) Calculated assuming 64% recovery rate;

(3) NMFS, Office of Industry & Trade

In 1993, the year that the harvest of king crab peaked, U.S. consumption (including inventory changes) of king crab bottomed at 5.5 million pounds. Between 1993 and 1998, U.S. consumption grew steadily reaching 35.6 million pounds in 1998, with over 75 percent from imports. The consumption pattern for snow crab has generally followed changes in harvest levels since the majority of snow crab is consumed domestically. Thus, consumption (including inventory changes) bottomed in 1995 at 30.5 million pounds and most recently peaked in 1998 at 160.5 million pounds. During the 1990's, the percentage of annual U.S. consumption that is imported (versus the percentage produced domestically) has increased for both king and snow crab. Imports of king crab comprised less than 10 percent of consumption in 1989 but over 80% of consumption in 1999. Similarly, imports of snow crab comprised less than 1 percent of consumption in 1989 but over 40% of consumption in 1999.

<u>Japan Imports of Crab by Country</u>. Table 2-9-10 shows the Japan imports of crab by product type and by country for the year 2000 in millions of pounds. In 2000, Japan imported a total of 301.6 million pounds of crab with a value of \$1.13 billion. The highest percentage of imports were from Russia (58%), followed by Canada (12%), China (11%), and the U.S. (5%). Japan imported 6.2 million and 7.1 million pounds of king and snow crab from the U.S., respectively. Japan, however, imported five times as much snow crab from Canada and more than 10 times as much king and snow crab from Russia that year. Japan also imported over 10 million pounds of snow crab (live, fresh or chilled) from North Korea.

Table 2-9-9 Estimated Consumption (+ Inventory Change) of Snow Crab (in millions of pounds)

	Produ	ction				Consumption
Year	Catch ¹	Product ²	Import ³	Export ³	Re-Expo ³	+ Chg Inv
1989	164.7	102.1	0.84	0.5	0.08	102.32
1990	213.4	132.3	2.69	3.3	0.06	131.63
1991	357.2	221.5	5.32	71.9	0.00	154.90
1992	350.1	217.1	5.49	137.1	0.02	85.41
1993	255.8	158.6	8.90	101.9	0.11	65.51
1994	159.6	99.0	10.29	68.8	0.05	40.42
1995	80.8	50.1	7.96	27.3	0.22	30.53
1996	67.9	42.1	11.26	22.2	0.13	31.05
1997	118.9	73.7	19.44	23.0	0.05	70.13
1998	251.9	156.2	31.38	26.8	0.29	160.47
1999	185.2	114.8	60.70	35.7	0.02	139.83

Sources: (1) U.N. FAO; (2) Calculated assuming 62% recovery rate;

(3) NMFS, Office of Industry & Trade

Table 2-9-10 Japan Imports of Crab in 2000 by Country (million pounds)

	Russia C	Canada	China	U.S.	N. Korea	Other	Total
Frozen king crabs	41.4	0.1	0.8	6.1	-	0.5	48.9
King crabs	46.1	-	-	0.0	0.0	-	46.2
Frozen snow crabs	25.8	35.3	0.9	7.0	0.2	5.4	74.5
Snow crabs	49.1	0.0	-	0.1	10.4	0.1	59.8
Frozen swimming crabs	-	-	15.4	0.2	-	12.9	28.4
Swimming crabs	-	-	2.6	0.0	-	8.0	3.3
Frozen crabs (other)	0.4	0.0	0.3	0.3	0.2	0.7	1.9
Crabs (other)	9.5	0.0	0.2	-	0.2	1.1	11.0
Crab preserved (no rice)	1.6	1.0	14.0	0.4	0.0	10.2	27.2
Crab (airtight containers)	0.1	-	-	0.0	-	0.1	0.2
Crabs, dried, salted	-	-	0.1	0.0	0.0	0.0	0.1
Subtotal King Crab	87.5	0.1	0.8	6.2	0.0	0.5	95.1
Subtotal Snow Crab	74.9	35.4	0.9	7.1	10.6	5.5	134.3
Subtotal	174.0	36.6	34.2	14.1	10.9	31.7	301.6
Percent of Total	58%	12%	11%	5%	4%	11%	100%

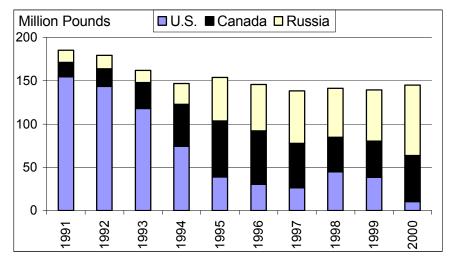
Source: Ministry of Finance International Trade Statistics

Table 2-9-11 Japan Snow Crab Inventories, Imports and Consumption 1991-2000

	Beginning		Impor	ts/Produ	ction		Ending	Consump-	% from
Year	Inventory	U.S.	Canada	Russia	Coastal	Total	Inventory	tion	U.S.
1991	6.6	154.3	16.8	14.1	18.7	203.9	13.2	197.3	78.2%
1992	13.2	143.3	20.5	15.4	17.6	196.9	15.4	194.7	73.6%
1993	15.4	117.9	29.8	14.3	9.7	171.7	8.8	178.4	66.1%
1994	8.8	74.1	48.7	24.0	11.0	157.9	13.2	153.4	48.3%
1995	13.2	38.6	65.0	50.0	8.8	162.5	19.8	155.9	24.8%
1996	19.8	30.2	61.9	53.6	3.3	149.0	22.0	146.8	20.6%
1997	22.0	26.0	51.4	60.6	2.9	140.9	11.0	151.9	17.1%
1998	11.0	44.8	39.7	56.4	2.2	143.1	11.0	143.1	31.3%
1999	11.0	38.1	41.9	59.3	4.4	143.7	22.0	132.7	28.7%
2000	22.0	10.4	52.9	81.6	4.4	149.3	22.0	149.3	6.9%

Source: Bill Atkinson, Japanese seafood market analyst.

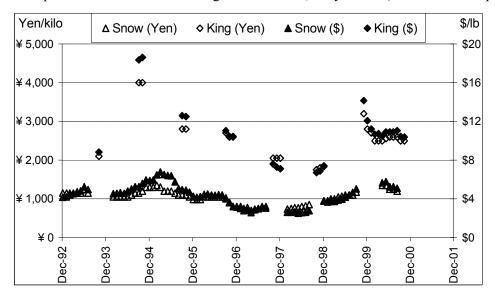
Japan Inventories, Imports and Consumption of Snow Crab. Table 2-9-11 shows Japan beginning and ending inventories, imports/production and consumption of snow crab for 1991-2000. The snow crab imports from the U.S., Russia and Canada are graphed in Figure 2-9-3. This data was obtained from Bill Atkinson, an analyst for the Japan seafood markets, and exhibits some modest differences from the data obtained from NMFS and the Japan Ministry of Finance. We believe these differences are largely due to differences in product categorization and the timing of reporting. As shown, Japan's consumption of snow crab has declined during the 1991-2000 period, from 197 million pounds (in 1991) to 149 million pounds (in 2000). Imports of snow crab from the U.S. have declined during this period, both in terms of pounds and as a percentage of consumption. In 1991, imports from the U.S. comprised 78% of consumption while, in 2000, imports comprised only 7% of consumption. Growth in imports from Canada and Russia have partially offset the decline in imports from Russia grew from 14 million to 82 million pounds. Compared to U.S. consumption of snow crab (see Table 2-9-9), Japan's annual consumption has exceeded U.S. consumption during most of the 1990's. In 1998 and 1999, however, the U.S. consumed amounts of snow crab that were comparable to the amounts consumed by Japan.



Source: Bill Atkinson, Japanese seafood market analyst.

Figure 2-9-3 Japanese imports of snow crab (millions of pounds).

Japanese Wholesale Market Prices. Figure 2-9-4 shows Japanese wholesale market prices for Alaskan snow and king crab in Japanese yen and U.S. dollars. The wholesale prices in dollars were calculated from the prices in yen and the average monthly exchange rates (yen per dollar). Japanese wholesale prices for king crab have exhibited a high degree of variability during the 1990's. King crab prices spiked up to 4000 yen/kilo (above \$18/lb) in 1994, fell below 2000 yen/kilo (below \$7.00/pound) in 1998, and again spiked above 3000 yen/kilo (above \$12/lb) in late 1999. By contrast, Japanese wholesale prices for snow crab have been somewhat more stable in terms of yen/kilo (or \$/pound) but as volatile on a percentage basis. During the 1993-2000 period, Japanese wholesale prices for snow crab have ranged from 700-1,400 yen/kilo (or \$2.50 - \$6.80 per pound).



Source: Bill Atkinson, Japanese seafood market analyst.

Figure 2.3-6 Japanese Wholesale Prices for Alaskan King and Snow Crab

Appendix 3-1 NOAA GC Letter

Appendix 3-2: Analysis of QS Ownership Caps Using Vessel Ownership Data

Fishery	Catcher Processor	Sum of Owners Over 8 Percent Cap	Sum of Owners Over 5 Percent Cap	Sum of Owners Over 1 Percent Cap	Sum of Owners Over 0.5 Percent Cap	Number of Owners
Bering Sea Opilio						
Option 1A -1994 - 1999 (Best of 5 seasons)	No Yes	0		0		
Option 2A - 1992 - 1999 (Best of 7 seasons)	No Yes	0	_	0	59 12	240
Option 3A -1995 - 1999 (All seasons)	No Yes	0		*	66	231
Option 3B - 1995 - 1999 (Best of 4 seasons)	No Yes	0	_	0	66 10	231
Option 4A -1996 - 2000 (Best of 4 seasons)	No Yes	0		0		233
Bristol Bay Red King Crab						
Option 1A -1993 - 1999 (All seasons)	No Yes	0		0		255 16
Option 1B - 1992 - 1999 (Best of 4 seasons)	No Yes	0	0	0		
Option 2A -1993 - 1999 (All seasons)	No Yes	0		0	55	255 16
Option 2B - 1992 - 1999 (Best of 5 seasons)	No Yes	0	-	0		255 16
Option 3A -1996 - 2000 (Best of 4 seasons)	No Yes	0		0		
Bering Sea Bairdi (EBS Tanner Crab)						
Option 1A -1992 - 1996 (All seasons)	No Yes	0		*	79 6	252 16
Option 1B - 1992 - 1996 (Best of 4 seasons)	No Yes	0		*	76 9	252 16
Option 2A -1991-1992 - 1996 (Best of 5 seasons)	No Yes	0	0	*	71 9	253 16
Pribilof Red King Crab						
Option 1A -1993 - 1998 (Best of 4 seasons)	No Yes	*	*	34 0		120
Option 2A -1994 - 1998 (All seasons)	No Yes	*	0	36 0		109 0
Option 2B - 1994 - 1998 (Drop one season)	No Yes	*	0	37 0		109 0
Pribilof Blue King Crab						
Option 1A -1993 - 1998 (Best of 4 seasons)	No Yes	0	* 0	35 0		83
Option 2A - 1994 - 1998 (All seasons)	No Yes	0	*	35 0	49	83
Option 2B -1994 - 1998 (Drop one season)	No Yes	0	*	35 0	49	83
St. Matthew Blue King Crab						
Option 1A -1993 - 1998 (Best 4 seasons)	No Yes	0	0	23 0		138 6
Option 2A - 1994 - 1998 (All seasons)	No Yes	0	0	33 0	92	
Option 2B - 1994 - 1998 (Drop one season)	No Yes	0	0	30 0	97	133 6

	Catcher	Sum of Owners Over 40 Percent	Sum of Owners Over 20	Sum of Owners Over 10 Percent	Number of
Fishery	Processor	Сар	Percent Cap	Сар	Owners
Eastern Aleutian Islands (Dutch Harbor) Golden King Crab	N.a.	^	*	*	47
Option 1A -1992-1993 to 1998-1999 (All seasons)	No Yes	0		0	17
Option 1B -1992-1993 to 1998-1999 (Drop one season)	No	0	-	*	17
Option 16 - 1992-1993 to 1990-1999 (Drop one season)	Yes	0		0	*
Option 2A -1995-1996 to 1998-1999 (All seasons)	No	0		*	13
Option 2A - 1990-1990 to 1990-1999 (All seasons)	Yes	0		0	0
Option 2B -1995-1996 to 1998-1999 (Drop one season)	No	0		*	13
Option 2B - 1000-1000 to 1000-1000 (B10p one 3cason)	Yes	0		0	0
Option 3A -1996-1997 to 1998-1999 (All seasons)	No	0	-	*	11
Option 6A - 1000-1007 to 1000-1000 (All 3casons)	Yes	0		0	0
Option 3B -1996-1997 to 1998-1999 (Drop one season)	No	0	~	5	11
option of 1000 1001 to 1000 1000 (Biop one ocason)	Yes	0		0	0
Option 4A -1996-1997 to 2000-2001 (Best 4 seasons)	No	0	-	4	11
Spain 11 1000 1007 to 2000 2001 (Book 1 66000110)	Yes	0		0	*
Western Aleutian Islands (Adak) Golden King Crab					
Option 1A -1992-1993 to 1998-1999 (All seasons)	No	0	0	0	20
Option 177 1002 1000 to 1000 1000 (7th occasions)	Yes	*	*	*	*
Option 1B -1992-1993 to 1998-1999 (Drop one season)	No	0	0	0	20
Option 18 1002 1000 to 1000 1000 (Biop one occasion)	Yes	*	*	*	*
Option 2A -1995-1996 to 1998-1999 (All seasons)	No	0	0	0	14
Space 27 1000 1000 to 1000 1000 (1 th 00000110)	Yes	*	*	*	*
Option 2B -1995-1996 to 1998-1999 (Drop one season)	No	0	0	0	14
	Yes	*	*	*	*
Option 3A -1996-1997 to 1998-1999 (All seasons)	No	0	0	0	9
.,	Yes	*	*	*	*
Option 3B -1996-1997 to 1998-1999 (Drop one season)	No	0	0	0	9
,	Yes	*	*	*	*
Option 4A -1996-1997 to 2000-2001 (Best 4 seasons)	No	0	0	*	10
	Yes	*	*	*	*
GHL Split EAI (Dutch Harbor)/Western Aleutian Islands (Ada	ık) Golden Kir	ng Crab			
Option 1A -1992-1993 to 1998-1999 (All seasons)	No	0	*	*	20
	Yes	0		*	*
Option 1B -1992-1993 to 1998-1999 (Drop one season)	No	0		*	20
,	Yes	0		*	*
Option 2A -1995-1996 to 1998-1999 (All seasons)	No	0	*	*	14
	Yes	0	*	*	*
Option 2B -1995-1996 to 1998-1999 (Drop one season)	No	0	*	*	14
	Yes	0	*	*	*
Option 3A -1996-1997 to 1998-1999 (All seasons)	No	0	*	*	11
,	Yes	0	*	*	*
Option 3B -1996-1997 to 1998-1999 (Drop one season)	No	0	*	*	11
	Yes	0	*	*	*
Option 4A -1996-1997 to 2000-2001 (Best 4 seasons)	No	0	*	*	11
	Yes	0	*	*	*

Fishery	Catcher Processor	Sum of Owners Over 30 Percent Cap	Sum of Owners Over 20 Percent Cap	Sum of Owners Over 10 Percent Cap	Number of Owners
Western Aleutian Islands (Adak) Red King Crab					
Option 1A -1992 - 1996 (All seasons)	No	0	0	*	27
	Yes	*	*	*	*
Option 1B -1992 - 1996 (Best 2 seasons)	No	0	0	*	27
	Yes	0	*	*	*

Appendix 3-3: Company Ownership of Processing Plants

Plant Type	Company	Plant or Vessel Name
Shore based	ADAK SEAFOODS LLC	ADAK SEAFOODS LLC - ADA
Shore based	ALASKA FRESH SEAFOODS INC.	ALASKA FRESH SEAFOODS INC KOD
Shore based	ALYESKA SEAFOODS INC.	ALYESKA SEAFOODS INC DUT
Shore based	BALLARD LAMAR	BALLARD LAMAR
Shore based	BALLARD LAMAR	BALLARD LAMAR - ANC
Catcher/processor	BARANOF FISHERIES	BARANOF
Catcher/processor	BLUE DUTCH LLC	BLUE DUTCH
Catcher/processor	BLUE DUTCH LLC	KISKA ENTERPRISE
Catcher/processor	CJW FISHERIES	PACIFIC LADY
Catcher/processor	CJW FISHERIES	PACIFIC WIND
Shore based	COOK INLET PROCESSING	COOK INLET PROCESSING - KOD
Catcher/processor	COURAGEOUS SEAFOODS	COURAGEOUS
Shore based	DEEP CREEK CUSTOM PACKING	DEEP CREEK CUSTOM PACKING - NIN
Catcher/processor	GOLDEN SHAMROCK INC.	PRO SURVEYOR
Catcher/processor	HIGHLAND LIGHT SEAFOODS	WESTWARD WIND
Shore based	HIS CATCH VALUE ADDED	HIS CATCH VALUE ADDED PRODUCTS
	PRODUCTS	
Floater	ICICLE SEAFOODS INC.	ARCTIC STAR
Floater	ICICLE SEAFOODS INC.	BERING STAR
Floater	ICICLE SEAFOODS INC.	COASTAL STAR
Floater	ICICLE SEAFOODS INC.	EVENING STAR INC.
Floater	ICICLE SEAFOODS INC.	NORTHERN VICTOR
Shore based	KING FISHER	KING FISHER
Shore based	MALEZI KWASI DBA	MALEZI KWASI DBA FISHERMAN OF AK
Floater	NORQUEST SEAFOODS INC.	ALEUTIAN FALCON
Floater	NORQUEST SEAFOODS INC.	LAFAYETTE
Shore based	NORQUEST SEAFOODS INC.	NORQUEST - ADAK INC
Shore based	NORQUEST SEAFOODS INC.	NORQUEST - CHIGNIK
Floater	NORQUEST SEAFOODS INC.	PRIBILOF
Shore based	NORTH ALASKA FISHERIES INC.	NORTH ALASKA FISHERIES INC.
Shore based	NORTH PACIFIC PROCESSORS INC.	NORTH PACIFIC PROCESSORS INC KOD
Shore based	OCEAN BEAUTY SEAFOODS INC.	OCEAN BEAUTY SEAFOODS INC-KOD
Floater	OCEAN BEAUTY SEAFOODS INC.	OCEAN PRIDE
Shore based	OSTERMAN FISH	OSTERMAN FISH
Catcher/processor	PATRICIA LEE INC.	PATRICIA LEE
Catcher/processor	PAVLOF INC.	NEW STAR
Catcher/processor	PAVLOF INC.	PAVLOF
Floater	PETER PAN SEAFOODS INC.	BLUE WAVE
Shore based	PETER PAN SEAFOODS INC.	PETER PAN - KCO
Shore based	PETER PAN SEAFOODS INC.	PETER PAN - MOL
Shore based	PRIME ALASKA SEAFOODS INC.	PRIME ALASKA SEAFOODS INC.
Shore based	PRIME ALASKA SEAFOODS INC.	PRIME ALASKA SEAFOODS INC.
Shore based	QUALITY ALASKAN SEAFOODS	ORION
Shore based	ROYAL ALEUTIAN SEAFOODS INC.	ROYAL ALEUTIAN SEAFOODS INC DUT
Catcher/processor	SANKO FISHERIES LLC	ALASKAN ENTERPRISE
Catcher/processor	SEAWIND FISHERIES	SEAWIND
Floater	SNOPAC PRODUCTS INC.	SNOPAC
Catcher/processor	SOUTH ATLANTIC FISHERIES LLC	MR. B
•		

Floater	STELLAR SEAFOODS INC.	STELLAR SEA
Floater	TRIDENT SEAFOODS CORP.	AKUTAN
Floater	TRIDENT SEAFOODS CORP.	ALASKA PACKER
Catcher/processor	TRIDENT SEAFOODS CORP.	BOUNTIFUL
Catcher/processor	TRIDENT SEAFOODS CORP.	GLACIER ENTERPRISE
Floater	TRIDENT SEAFOODS CORP.	INDEPENDENCE
Catcher/processor	TRIDENT SEAFOODS CORP.	NORTHERN ENTERPRISE
Catcher/processor	TRIDENT SEAFOODS CORP.	ROYAL ENTERPRISE
Floater	TRIDENT SEAFOODS CORP.	SEA ALASKA
Shore based	TRIDENT SEAFOODS CORP.	SOUTH NAKNEK
Floater	TRIDENT SEAFOODS CORP.	TEMPEST

Shore based TRIDENT SEAFOODS CORP. TRIDENT SEAFOODS CORP. - AKU Shore based TRIDENT SEAFOODS CORP. TRIDENT SEAFOODS CORP. - STP

Catcher/processor TRIDENT SEAFOODS CORP. WESTERN ENTERPRISE

Floater UNISEA INC. OMNISEA
Shore based UNISEA INC. UNISEA - STP
Shore based UNISEA INC. UNISEA INC. - DUT

Shore based WESTWARD SEAFOODS INC. WESTWARD SEAFOODS INC. - DUT

Shore based WHITTIER JOHN WALTER WHITTIER JOHN WALTER

Floater YARD ARM KNOT INC. YARD ARM KNOT

Appendix 3-4A Draft Language for Price Arbitration as an Independent Safeguard for Failed Price Negotiations Between Harvesters and Processors NPFMC Bering Sea/Aleutian Islands Crab Rationalization Plan

(With Provision for Administrator of the Arbitration Panel) [3/8/2002] (Additions to the 12/2001 draft appear in *italics*)

1. Parties.

The parties to this Agreement are those crab fishing companies listed on Exhibit A hereto (the "Harvesters") and those crab processing companies listed on Exhibit B hereto (the "Processors") who shall have signed this Agreement as parties. (To be provided at a future date.)

2. Establishment of the Price; Resolution of Disputes by Arbitration.

The price to be paid by a Processor to a Harvester for each species and for each fishery ("Price") shall be set [no later than two weeks] [as soon as reasonably possible] before the start of such fishery by good faith negotiations conducted by authorized representatives of the Harvester and the Processor, but if the parties shall fail to set a Price by [such date] [the start of such season]², then either party may submit the issue of determination of the Price to binding arbitration before a single arbitrator. Either party may initiate the arbitration process by serving on the other party a demand for arbitration in writing, which shall include the name of a proposed arbitrator. Arbitration shall proceed before a single arbitrator selected by the parties (which arbitrator may be, but need not be, a member of the Arbitration Panel), but if the parties shall fail to agree on an arbitrator within five business days from the date of the service of a demand for arbitration, then either party may submit the issue of the selection of the arbitrator to the Administrator of the Arbitration Panel, described below. Promptly upon receipt of the submission of a party, the Administrator shall designate a single arbitrator from the Arbitration Panel to hear the dispute, and the arbitrator so selected shall promptly contact the parties to arrange a hearing.

3. Hearing Procedure.

The seat of arbitration shall be Seattle, unless the parties and the arbitrator agree otherwise. The arbitrator shall set the procedures for conducting the arbitration, consistent with the provisions of this Article. If the parties and the arbitrator agree, the arbitration may be conducted, in whole or in part, by electronic means, so long as each party shall be afforded the opportunity to present evidence in the form of documents and the testimony of witnesses and to present oral and written argument in support of its position. After each party shall have presented its case to the arbitrator, the arbitrator shall request from each party its last best offer ("LBO"), and each party shall then promptly deliver its LBO to the arbitrator and to the other party in writing in sealed envelopes. The arbitrator shall then retire to consider the evidence and arguments presented by the parties. No later than the end of the third business day after receipt of the parties' LBOs, the arbitrator shall pronounce the arbitral award, which shall be the same as one or the other of the LBOs submitted by the parties. The parties are free to negotiate a settlement between themselves at any time before pronouncement of the arbitral award. The arbitral award, once pronounced, shall be final and binding on the parties; provided, however, that, after the pronouncement of the arbitral award and before the end of the current fishing season, if the market price for any species that is the subject of such arbitral award shall change by more than __%, then either party to the arbitration may petition the arbitrator, submitting evidence of such change

¹ Should this be a time certain or a fuzzy suggestion of promptness?

² This date should be certain in order to make clear at what point a party may demand arbitration.

in market price, and may request that the arbitrator adjust the award. A petition for such adjustment must be delivered to the arbitrator and the other party not later than fourteen days after the close of the fishing season for which such adjustment is requested. The arbitral award may be confirmed and enforced by any court of competent jurisdiction, and, for such purpose, each party consents to the nonexclusive jurisdiction and venue of the Superior Court for King County, Washington, Seattle Case Assignment Area, or the United States Federal District Court for the Western District of Washington at Seattle.

4. Costs and Fees.

Each party shall be responsible for its own costs incurred in connection with the arbitration, and the parties agree to pay the arbitrator's fee in equal shares. Each party shall pay the arbitrator's fee in advance; failure to pay the fee shall result in the party that failed to pay losing the arbitration. Notwithstanding the foregoing, should any party fail to participate in arbitration in good faith or fail to perform in accordance with the arbitral award, then the other party shall be entitled to an award of costs, arbitration fees and attorney's fees incurred as a result of the first party's failure to participate or to perform, including any such costs and fees incurred in enforcing the arbitral award.

5. Arbitration Panel.

a. Representatives of the Parties.

The Harvesters hereby designate the following person to serve as their initial representative:
The Processors hereby designate the following person to serve as their initial representative:

The Harvesters and the Processors, respectively, may replace their representative at any time upon the consent of no less than two-thirds of the Harvesters or Processors, as the case may be.

The representatives of the Harvesters and Processors are referred to herein as the "Representatives." The addresses of the Representatives, for notice purposes, are set forth on Exhibit C hereto.

b. Selection of Administrator.

Promptly after the execution of this Agreement, the Representatives shall select and retain a person to serve as the Administrator of the Arbitration Panel.

c. Selection of Arbitration Panel.

With the advice and consent of the Representatives, the Administrator shall recruit a panel of persons with relevant experience as an arbitrator of commercial disputes and having sufficient experience in the fishing industry (the Arbitration Panel). Each member of the Arbitration Panel shall commit to be available upon short notice at all relevant times to serve as arbitrator of price disputes between Harvesters and

Processors, shall agree to expedite the process of arbitration, and shall agree to accept fees in accordance with the fee schedule set by the Administrator.

d. Duties of the Administrator:

- (1) With the advice and consent of the Representatives, to select and maintain the Arbitration Panel with such number of qualified arbitrators as the Administrator shall deem sufficient for the purposes hereof.
- (2) With the advice and consent of the Representatives, to develop a budget for the expenses of administering and maintaining the Arbitration Panel, to set an arbitration fee schedule to be followed by the members of the Arbitration Panel, to levy assessments upon the parties, as necessary and appropriate to fund the duties of the Administrator, and to establish procedures for the selection of arbitrators from the Arbitration Panel to conduct price arbitration for the parties who request the same.
- (3) To receive submissions from the parties and to select arbitrators from the Arbitration Panel for parties who request an arbitrator, in accordance with the procedures established pursuant to subparagraph (2), above.
- (4) To account for all revenues and expenditures related to the purposes hereof and to maintain books and records of account available at all times during normal business hours for inspection by any party hereto.
- (5) To perform such other acts as the Administrator shall deem necessary and appropriate to accomplish the purposes hereof.

e. Compensation and Retention of the Administrator.

The Administrator shall be retained, on behalf of the parties hereto, by the Representatives, who shall set the compensation of the Administrator.³ The Administrator shall serve at the pleasure of the Representatives, who shall act by unanimous consent in retaining, removing, replacing and setting compensation for the Administrator. In addition to such compensation, the Administrator shall be entitled to reimbursement for any expenditures incurred in accordance with the budget, or as may be otherwise approved by the Representatives. The Representatives shall serve without compensation, and shall look to the Harvesters and Processors, respectively, for reimbursement of expenses incurred in connection with their responsibilities hereunder.

f. Assessments.

Each party hereto agrees to pay promptly into an account maintained by the Administrator for such purpose the amount of \$_____ as an initial assessment to fund the duties of the Administrator in accordance with the budget. In addition, each party agrees promptly to pay any additional assessment levied by the Administrator after receiving the advice and consent of the Representatives for such assessment. In addition to assessments, the Administrator may fund the budget by deducting a portion of the arbitration fees paid by the parties, if such mechanism is deemed appropriate and consented to by the Representatives.

³ The position of the Administrator would be part time. The Administrator would probably be paid an hourly fee as an independent contractor. The Administrator could be a lawyer or arbitrator with experience in the fishing industry.

Alternative A:

6. Withdrawal of a Party and Termination.

Any party who is current in payment of assessments may withdraw from this Agreement by giving written notice to each other party [and to the Administrator] of intent to withdraw no later than ten days before the beginning of any Fishing Season (as announced by the Alaska Department of Fish and Game), which withdrawal shall be effective ten days after the close of such Fishing Season. A withdrawing party shall not be entitled to any refund of assessments paid. Withdrawal by a party shall not cause a termination of this Agreement so long as there remains at least one Processor and one Harvester as parties. At any time, the remaining parties may agree to terminate this Agreement by a unanimous agreement in writing to terminate, in which case the Administrator shall settle all accounts and distribute any remaining funds to the parties in equal shares.

Alternative B:

6. Termination.

This Agreement shall come into effect on the date last below written and shall remain in full force and effect until midnight, ______, 200_, at which time it shall terminate automatically without notice. This Agreement may be terminated or extended at any time by the unanimous agreement in writing of all the parties hereto. Upon termination the Administrator shall settle all accounts and distribute any remaining funds to the parties in equal shares.

7. Time of the Essence.

Time is of the essence of this Agreement. Each party agrees to act and respond promptly to any and all requirements of the arbitration process as set forth herein and as set by any arbitrator hereunder. The Administrator shall secure a commitment from each member of the Arbitration Panel to act promptly in arbitrating any matter hereunder.

8. Notices.

All notices, demands, submissions and other communications required by or related to this Agreement shall be in writing and shall be effective when actually received, regardless of by what means transmitted, whether by mail, messenger, personal service, electronic means, or other means. All such communications shall be sent to the addresses set forth on the Exhibits to this Agreement, or to such address as may have been notified pursuant to this Article.

9. Performance during Pendency of Arbitration.

In the event that any parties hereto, having agreed to all of their respective obligations concerning the harvesting and processing of any species of crab for any season except for the Price to be paid by the Processor to the Harvester, notwithstanding the fact that the Price has not been set, if either of such parties shall submit the determination of the Price to arbitration hereunder, then both such parties shall proceed to perform their respective obligations to harvest and process crab under their contract during the pendency of the arbitration and shall settle the Price promptly upon the pronouncement of the arbitral award.

10. Independent Parties.

The parties to this Agreement are independent parties and no party has the authority to bind any other party except through the actions of the Representatives as specifically set forth herein. This Agreement shall not be construed to create a partnership or joint venture of the parties.

11. Successors and Assigns, Third Parties.

This Agreement binds the parties, their successors and assigns, but is not made for the benefit of any third party.

Appendix 3-4B Draft Language for Price Arbitration as an Independent Safeguard for Failed Price Negotiations Between Harvesters and Processors NPFMC Bering Sea/Aleutian Islands Crab Rationalization Plan

(Without Provision for Administrator) [3/8/2002] (Additions to the 12/2001 draft appear in *italics*)

1. Parties.

The parties to this Agreement are those crab fishing companies listed on Exhibit A hereto (the "Harvesters") and those crab processing companies listed on Exhibit B hereto (the "Processors") who shall have signed this Agreement as parties.

2. Establishment of the Price; Resolution of Disputes by Arbitration.

The price to be paid by a Processor to a Harvester for each species and for each fishery ("Price") shall be set [no later than two weeks] [as soon as reasonably possible] before the start of such fishery by good faith negotiations conducted by authorized representatives of the Harvester and the Processor, but if the parties shall fail to set a Price by [such date] [the start of such season], then either party may submit the issue of determination of the Price to binding arbitration before a single arbitrator. Either party may initiate the arbitration process by serving on the other party a demand for arbitration in writing, which shall include the name of a proposed arbitrator. Arbitration shall proceed before a single arbitrator selected by the parties (which arbitrator may be, but need not be, a member of the Arbitration Panel), but if the parties shall fail to agree on an arbitrator within five business days from the date of the service of a demand for arbitration, then either party may submit the issue of the selection of the arbitrator to the Representatives of the parties, as described below at Article 5. Promptly upon receipt of the submission of a party, the Representatives shall designate a single arbitrator from the Arbitration Panel to hear the dispute, and the arbitrator so selected shall promptly contact the parties to arrange a hearing.

3. Hearing Procedure.

The seat of arbitration shall be Seattle, unless the parties and the arbitrator agree otherwise. The arbitrator shall set the procedures for conducting the arbitration, consistent with the provisions of this Article. If the parties and the arbitrator agree, the arbitration may be conducted, in whole or in part, by electronic means, so long as each party shall be afforded the opportunity to present evidence in the form of documents and the testimony of witnesses and to present oral and written argument in support of its position. After each party shall have presented its case to the arbitrator, the arbitrator shall request from each party its last best offer ("LBO"), and each party shall then promptly deliver its LBO to the arbitrator and to the other party in writing in sealed envelopes. The arbitrator shall then retire to consider the evidence and arguments presented by the parties. No later than the end of the third business day after receipt of the parties' LBOs, the arbitrator shall pronounce the arbitral award, which shall be the same as one or the other of the LBOs submitted by the parties. The parties are free to negotiate a settlement between themselves at any time before pronouncement of the arbitral award. The arbitral award, once pronounced, shall be final and binding on the parties; provided, however, that, after the pronouncement of the arbitral award and before the end of the current fishing season, if the market price for any species that is the subject of such arbitral award shall change by more than __%, then either party to the arbitration may petition the arbitrator, submitting evidence of such change

¹ Should this be a time certain or a fuzzy suggestion of promptness?

² This date should be certain in order to make clear at what point a party may demand arbitration.

in market price, and may request that the arbitrator adjust the award. A petition for such adjustment must be delivered to the arbitrator and the other part not later than fourteen days after the close of the fishing season for which such adjustment is requested. The arbitral award may be confirmed and enforced by any court of competent jurisdiction, and, for such purpose, each party consents to the nonexclusive jurisdiction and venue of the Superior Court for King County, Washington, Seattle Case Assignment Area, or the United States Federal District Court for the Western District of Washington at Seattle.

4. Costs and Fees.

Each party shall be responsible for its own costs incurred in connection with the arbitration, and the parties agree to pay the arbitrator's fee in equal shares. Each party shall pay the arbitrator's fee in advance; failure to pay the fee shall result in the party that failed to pay losing the arbitration. Notwithstanding the foregoing, should any party fail to participate in arbitration in good faith or fail to perform in accordance with the arbitral award, then the other party shall be entitled to an award of costs, arbitration fees and attorney's fees incurred as a result of the first party's failure to participate or to perform, including any such costs and fees incurred in enforcing the arbitral award.

5. Arbitration Panel.

a. Representatives of the Parties.

The Harvesters hereby designate the following person to serve as their initial representative:
The Processors hereby designate the following person to serve as their initial representative:

The Harvesters and the Processors, respectively, may replace their representative at any time upon the consent of no less than two-thirds of the Harvesters or Processors, as the case may be.

The representatives of the Harvesters and Processors are referred to herein as the "Representatives." The addresses of the Representatives, for notice purposes, are set forth on Exhibit C hereto.

b. Selection of Arbitration Panel.

The Representatives, acting by unanimous consent, shall recruit a panel of persons with relevant experience as an arbitrator of commercial disputes and having sufficient experience in the fishing industry (the Arbitration Panel). Each member of the Arbitration Panel shall commit to be available upon short notice at all relevant times to serve as arbitrator of price disputes between Harvesters and Processors, shall agree to expedite the process of arbitration, and shall agree to accept fees in accordance with the fee schedule set by the Representatives.

d. Duties of the Representatives:

- (1) To select and maintain the Arbitration Panel with such number of qualified arbitrators as the Representatives shall deem sufficient for the purposes hereof.
- (2) To set an arbitration fee schedule to be followed by the members of the Arbitration Panel, and to establish procedures for the selection of arbitrators from the Arbitration Panel to conduct price arbitration for the parties who request the same.
- (3) To receive submissions from the parties and to select arbitrators from the Arbitration Panel for parties who request an arbitrator, in accordance with the procedures established pursuant to subparagraph (2), above.
- (4) To retain, on behalf of the Harvesters and Processors, the services of professionals or advisers, as deemed necessary and appropriate by the Representatives.
- (5) To perform such other acts as the Representatives shall deem necessary and appropriate to accomplish the purposes hereof.

e. Reimbursement of Expenses.

The Representatives shall serve without compensation, and shall look to the Harvesters and Processors, respectively, for reimbursement of expenses incurred in connection with their responsibilities hereunder.

Alternative A:

6. Withdrawal of a Party and Termination.

Any party who is current in payment of assessments may withdraw from this Agreement by giving written notice to each other party [and to the Administrator] of intent to withdraw no later than ten days before the beginning of any Fishing Season (as announced by the Alaska Department of Fish and Game), which withdrawal shall be effective ten days after the close of such Fishing Season. A withdrawing party shall not be entitled to any refund of assessments paid. Withdrawal by a party shall not cause a termination of this Agreement so long as there remains at least one Processor and one Harvester as parties. At any time, the remaining parties may agree to terminate this Agreement by a unanimous agreement in writing to terminate, in which case the parties shall settle all accounts and distribute any remaining funds to the parties in equal shares.

Alternative B:

6. Termination.

This Agreement shall come into effect on the date last below written and shall remain in full force and effect until midnight, ______, 200_, at which time it shall terminate automatically without notice. This Agreement may be terminated or extended at any time by the unanimous agreement in writing of all the

parties hereto. Upon termination the parties shall settle all accounts and distribute any remaining funds to the parties in equal shares.

7. Time of the Essence.

Time is of the essence of this Agreement. Each party agrees to act and respond promptly to any and all requirements of the arbitration process as set forth herein and as set by any arbitrator hereunder. The Representatives shall secure a commitment from each member of the Arbitration Panel to act promptly in arbitrating any matter hereunder.

8. Notices.

All notices, demands, submissions and other communications required by or related to this Agreement shall be in writing and shall be effective when actually received, regardless of by what means transmitted, whether by mail, messenger, personal service, electronic means, or other means. All such communications shall be sent to the addresses set forth on the Exhibits to this Agreement, or to such address as may have been notified pursuant to this Article.

9. Performance during Pendency of Arbitration.

In the event that any parties hereto, having agreed to all of their respective obligations concerning the harvesting and processing of any species of crab for any season except for the Price to be paid by the Processor to the Harvester, notwithstanding the fact that the Price has not been set, if either of such parties shall submit the determination of the Price to arbitration hereunder, then both such parties shall proceed to perform their respective obligations to harvest and process crab under their contract during the pendency of arbitration and shall settle the Price promptly upon the pronouncement of the arbitral award.

10. Independent Parties.

The parties to this Agreement are independent parties and no party has the authority to bind any other party except through the actions of the Representatives as specifically set forth herein. This Agreement shall not be construed to create a partnership or joint venture of the parties.

11. Successors and Assigns, Third Parties.

This Agreement binds the parties, their successors and assigns, but is not made for the benefit of any third party.

Appendix 3-5 Application for Entry Permit Southeastern Crab Pot Fishery

APPLICATION FOR ENTRY PERMIT SOUTHEASTERN ALASKA RED AND BLUE KING CRAB POT FISHERY

COMMERCIAL FISHERIES ENTRY COMMISSION P.O. BOX KB JUNEAU, ALASKA 99811

This is an application for a permanent entry permit for the SOUTHEASTERN ALASKA RED AND BLUE KING CRAB POT fishery. If you wish to apply for a permanent entry permit, complete this application and submit it to the Commission before April 30, 1987. ALL ELIGIBLE FISHERMEN ARE STRONGLY URGED TO SUBMIT APPLICATIONS REGARDLESS OF THE NUMBER OF POINTS CLAIMED. A non-refundable application fee of \$100 is required and should be submitted with each application. Without the application fee your application will not be processed. Alaska residents may apply for a reduced application fee of \$30 if their total family income falls within the poverty guidelines. See pages 25 and 26 of the instruction booklet for the poverty guidelines. THE APPLICATION DEADLINE IS APRIL 30, 1987. Late applications may be accepted until June 30, 1987, if the applicant can demonstrate good cause for the late filing.

IMPORTANT: Read the instruction this application. (Please Pri		Commission Use Only Date Issued
Name (First, M.1., Last)	1	Perm.Fermit No.
Permanent Mailing Address	Physical Location	Date Awarded
Temporary Mailing Address		Verified Points
Birthdate	Social Security Number	Fee Received:
		/_/Cash /_/Check /_/M.O.

INTERIM-USE PERMITS for the 1987 crab seasons must be applied for by a separate interim-use permit application form. No applications for interim-use permits for these limited crab fisheries will be accepted after the application deadline of April 30, 1987 unless you have a permanent permit application on file.

We recommend you mail your application by certified or registered mail, especially if mailing close to the application deadline. The Commission will mail you notice to verify the receipt of your application. IF YOU DO NOT RECEIVE VERIFICATION FROM THE COMMISSION WITHIN TWO WEEKS AFTER YOU MAIL YOUR APPLICATION, YOU SHOULD CONTACT THE COMMISSION BY MAIL OR BY TELEPHONE AT (907) 586-3456. If you are unable to mail or deliver your application to the Commission by the deadline, you will be allowed to submit it until June 30, 1987, ONLY IF YOU ARE ABLE TO DEMONSTRATE GOOD CAUSE FOR LATENESS. MAKE EVERY REPORT TO FILE YOUR APPLICATION BY THE APRIL 30, 1987 DEADLINE.

THE APPLICATION DEADLINE IS APRIL 30, 1987.

Fart I. Fishing History

ITEMS I-1 THROUGH I-3 MUST BE COMPLETED BY ALL ELIGIBLE APPLICANTS. If a particular item does not apply to you or your situation, you must check the box(es) marked N/A (Not Applicable). If additional space is needed to answer any of the items, use the space on the back of this booklet, or additional sheets. Please refer to the item number when responding.

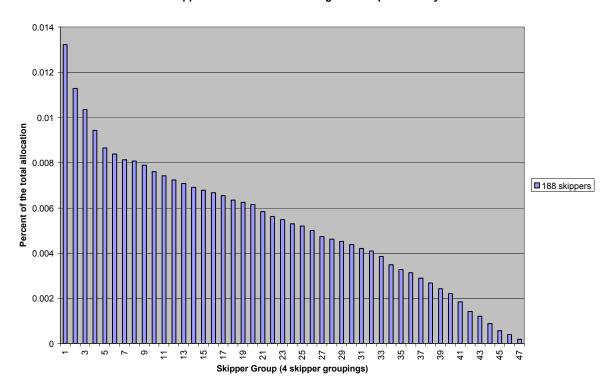
	time between	TO APPLY: You must have e or interim-use permit n 1960 and December 31, ste the year(s), ADF&G n rab.	holder in Southeaster	rn Alaska some
Year	г	ADF&G Number Vess	el Name From Which La	andings Were Recorded
I-2.F	or each of	the following year(s) in	which you participa	ted in the Southenstern
T	ed and blue	king crab fishery, chec	k the type(s) of lic	ense(s) you held.
20.77				
N/A	Year(s)	Crewmember License	Gear License	Interin-Use Permit
_ N/A /				
	Year(s)		Gear License	
\Box	Year(s) 75	Crewmember License	Gear License	Interim-Use Permit
	Year(s) 75 76	Crewmember License	Gear License	Interim-Use Permit
	Year(s) 75 76 77	Crewmember License	Gear License	Interim-Use Permit
	Year(s) 75 76 77 78	Crewmember License	Gear License	Interim-Use Permit
	Year(s) 75 76 77 78 79		Gear License	Interin-Use Permit
	Year(s) 75 76 77 78 79 80	Crewmember License	Gear License	Interin-Use Permit
	Year(s) 75 76 77 78 79 80 81		Gear License	Interin-Use Permit

Appendix 3-6. An Example of Skipper Allocations under Section 1.8 Option I.V..i of the Council Motion (based on ADF&G Landings)

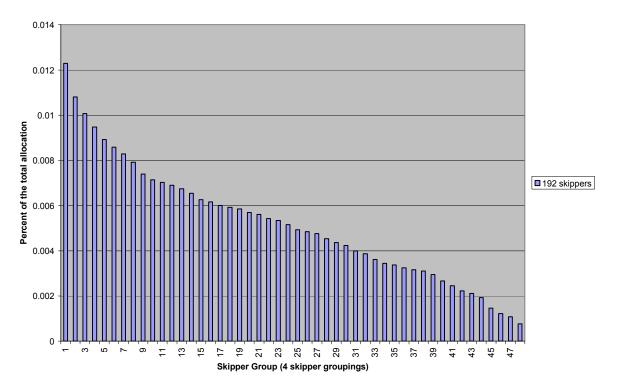
Graphs are used to illustrate the allocations to skippers under in the different fisheries under Section 1.8 Option I.V..i of the Council Motion . The example uses only the qualification years of Option 1A for each fishery. To protect confidentiality, the allocations are shown in groups of 4 skippers, with skipper groupings made in a descending order from the largest estimated allocation to the smallest allocation. The last and smallest grouping contains between 4 and 7 estimated allocations, since at least 4 persons' activities must be included under confidentiality rules. The estimated allocation shown for each group is the average allocation to members of that group. The allocation is shown as a percentage of the total allocation to skippers in the fishery. Because allocations are averages it is possible, particularly in the grouping with the largest allocation, that the largest allocation to a single skipper is significantly different from the average of those four skippers.

Graphs are presented for all fisheries, with the exception of the Western Aleutian Islands (Adak) red king crab fishery, in which only two skippers qualify for an allocation. Confidentiality requires that the allocation to those skippers be withheld.

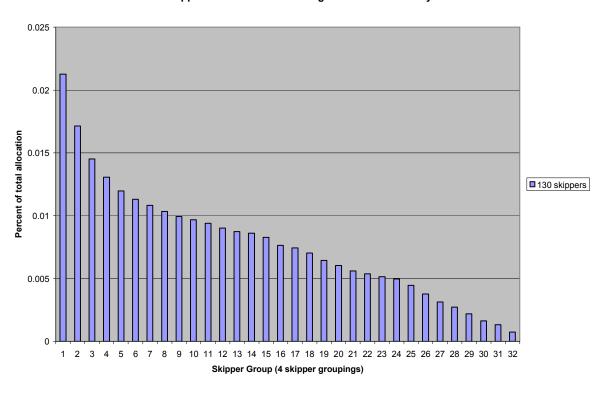
Skipper Allocations in the Bering Sea C. Opilio Fishery



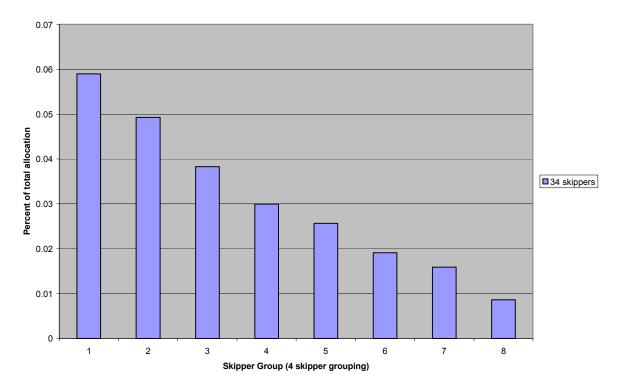
Skipper Allocations in the Bristol Bay Red King Crab Fishery



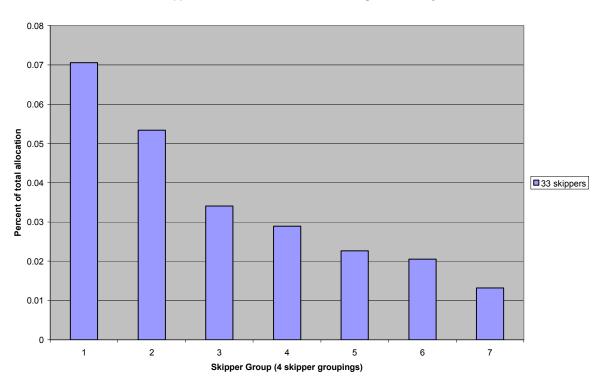
Skipper Allocation in the Bering Sea C. Bairdi Fishery



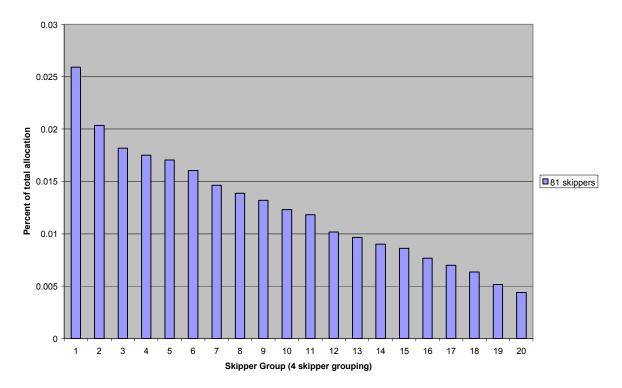
Skipper Allocation in the Pribilof Red King Crab Fishery



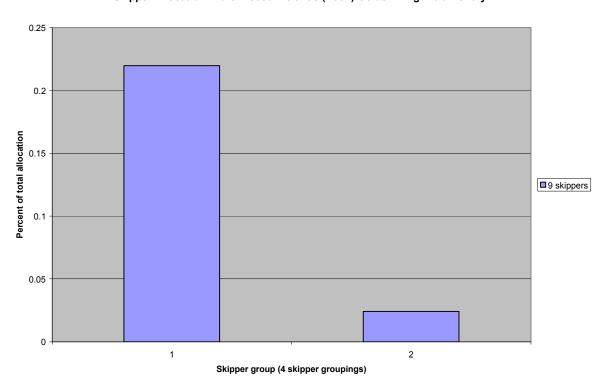
Skipper Allocation in the Pribilof Blue King Crab Fishery



Skipper Allocation in the St. Matthew Blue King Crab Fishery



Skipper Allocation in the Aleutian Islands (Adak) Golden King Crab Fishery



Skipper Allocations in the Eastern Aleutian Islands (Dutch Harbor) Golden Brown King Crab Fishery

